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Stan Roberts and Staff — VK3BSR

AMATEUR RADIO

Vol. 52, No. 10, October 1984

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

Two Metre Receiving Converter to construct

How to Use OSCAR 10

Full WIA Videotape Directory

1984 Commonwealth Contest Results

Rules for 1984 ALARA & CQ WWDX Contests

Reminiscing the First WIA International Contest

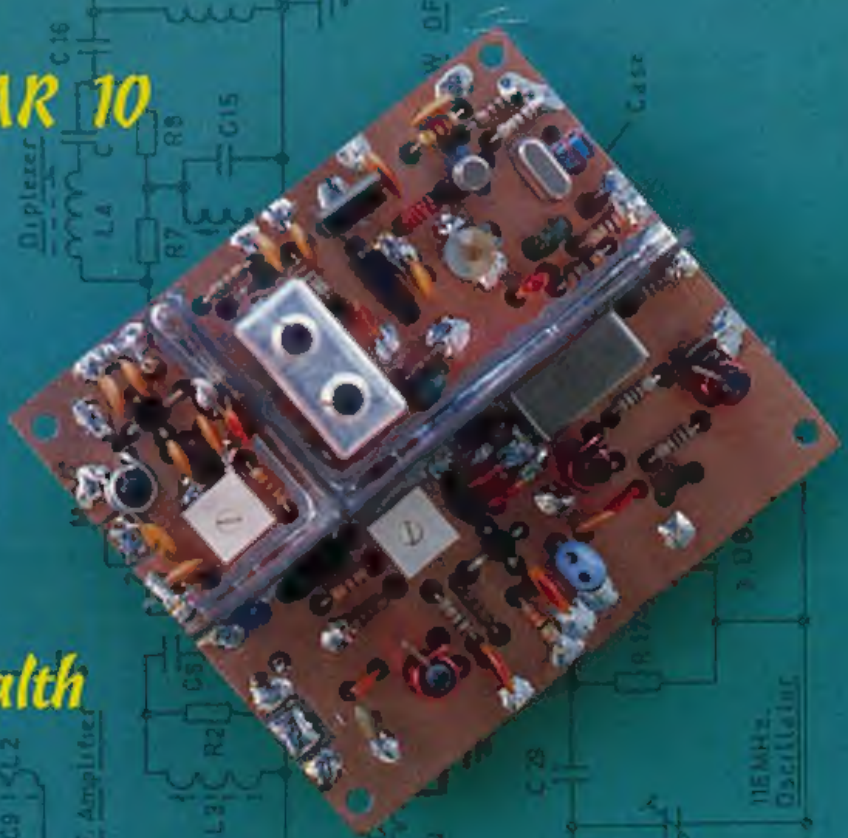
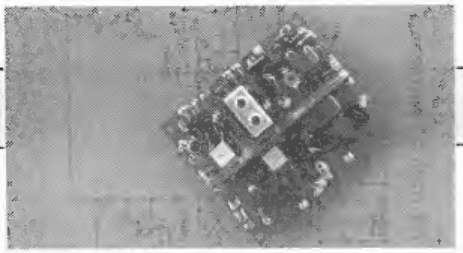


Fig.1. CIRCUIT OF 2 METRE RECEIVER CONVERTER.



Prototype two metre converter designed and constructed by Harold Hepburn VK3AFQ. Turn to page 12 for full construction details.
Photograph by Ken McLachlan VK3AH

AMATEUR RADIO

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TECHNICAL FEATURES

SPECIAL FEATURES

REGULAR FEATURES

Next year will be a major historic year for the Institute as we celebrate the Seventy Fifth Anniversary and this month there is a small taste of —"looking back".

The Federal Historian, Max Hull VK3ZS has written a superb article telling of the First WIA International Contest held in 1934 — see page 10. Max has also dipped into the archives to provide some photographs of the winners, of this contest, to illustrate the story.

Max also relates to Jim Linton VK3PC (page 20) how the Institute became involved in printing an Australian call sign listing of amateurs. The current issue of the WIA Call Book sees the publication in its thirtieth year.

Alan Shawsmith VK4SS provides readers with an insight into wireless in VK4 during the 1930s when he chats with three old timers on page 20.

Are there any "amateur historians" from other states who could pen some short profiles about some of the pioneers from their state?

Photos for the magazine are always welcome but please beware. A contributor this month sent some photographs for inclusion in the magazine and had written on the reverse side with a felt tip pen. Unfortunately he had placed the photos on top of one another before they were dry and the result was some badly damaged pictures. Always be wary of these pens as they take some time to dry on photographic paper.

Could all contributors of computer programmes for inclusion in AR ensure they have a dark ribbon in their printer before the final printout; to assist good reproduction please.

Those who have not paid their amateur licence recently may be in for a surprise. As from 1st September, licence fees were increased — see page 44.

Technical features this month include the concluding article of "Feed Impedances", Gordon Bracewell explains the principles for working OSCAR 10, Harold Hepburn has been busy in the workshop designing a 2m Converter plus other interesting articles.

DEADLINE

All copy for December AR must arrive at PO Box 300, Caulfield South, Vic 3162 at the latest by midday 25th October 1984.

Enquiries and material to:
The Editor
PO Box 300, Caulfield South Vic 3162

Material should be sent direct to **PO Box 300, Caulfield South Vic., 3162,** by the **25th of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Phone: (03) 528 5962.** Hamads should be sent direct to the same address.

Acknowledgement may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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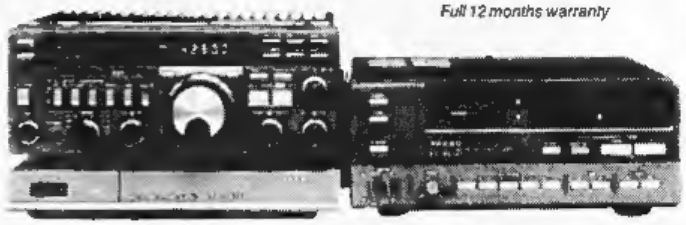

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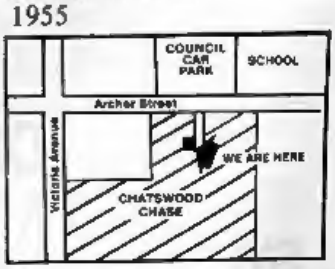


a word from your EDITOR

CAN WE PRINT IT? DO YOU WANT IT?

Recently a thoughtful VK2 sent us copies of articles published in one of the learned society journals. They seemed interesting enough, he said, to consider re-printing them. Frequently there *are* articles in the professional journals of interest to amateurs, but only in rare cases are we able to re-print them. The VK2 has long since received a letter explaining the restrictions of copyright but perhaps it may interest you to read about it here.

You may say "But only a few months ago you re-printed something from QST." (or Radio Communications, Break-In, Radio ZS, etc). These are our sister amateur journals, and between them all there is a special agreement that re-printing is permissible (if the source is acknowledged). 73, CQ and others are a little different, being commercially produced, not published by a national amateur society. But there is agreement here too, perhaps along the lines of "You can have one of ours if we can have one of yours!"

With organisations like the IEE, IEEE, IREE etc, the situation is quite different. Usually their material is firmly copyright. It can only be re-printed with permission, and by payment of royalties. It would need to be a very special article indeed to persuade us to hand over any more of your subscription funds than our budget permits. Sometimes royalties may be waived, as in one case when the IREE allowed us to re-print an antenna article. But the IREE and the WIA might be described as cousins, since both originated from the same source back at the beginning of the century.

On a slightly different note, from time to time we wonder if we are publishing the type of material you want. Seeing that you, the members, write most of it we can't be too far wrong. But it would be nice to know what proportion of you read this, that and the other! At the last Federal Convention it was decided we should conduct a survey to find out.

So now your chance is coming, in the form of a multi-choice questionnaire which will be sent to every member with the subscription renewal notice. Don't throw it away! Bury us in a flood of returned filled in forms so that we can paint a new statistical picture of amateur radio in 1984.

Bill Rice VK3ABP Editor

AR

WIA NEWS

SPECIAL HIGH SPEED AMATEUR MORSE TESTS

In reference to recent discussions between the Institute and the Department of Communications concerning the conclusion of formal arrangements for special high speed amateur Morse tests. These tests have, to date, been provided by the Department on a trial basis and without fee.

The Department will now provide high speed Morse tests as a permanent service to the amateur fraternity. The main aim is to assist amateurs to obtain a reciprocal licence when visiting overseas countries where Morse standards are higher than in Australia. Tests at speeds of 12, 14, 15 and 16 words per minute were utilised during the trial period.

The following conditions are applicable to the new arrangements which are now in force:

1 *Amateur Licensees may apply to sit a high speed Morse test at any of the Department's Radio Frequency Management offices.*
2 *As with all special examinations, these tests will be provided on a mutual convenience basis. Tests at any reasonable speed above 10 WPM can be arranged, subject to availability of a suitably qualified Departmental examiner.*
3 *High speed Morse tests will, in general, follow the same system in terms of format and marking as the standard amateur Morse examinations. The exception will be that the Morse character/space ratio will be as described in the ITU Radio Regulations. A pass will be awarded to candidates who achieve 10 errors or less in Receiving, as well as 5 errors or less in Sending.*
4 *An accreditation document attesting to the candidates ability in Morse at the appropriate speed will be issued to successful candidates.*
5 *A fee of $20 per test will be applied. In view of the one-off nature of these tests, this fee reflects a realistic balance between the costs of providing the service and its value to interested persons. The level of the fee will be reviewed from time to time.*

A sample of the accreditation document being issued to successful candidates is enclosed for your information. It would be appreciated please if the Institute could publicise the details of this service in the usual manner.

AR

SEVENTY FIFTH LOGO COMPETITION

The response to the competition was very satisfactory. All entries were of a very high standard, which made the judging very difficult.

Prize Winner	**D BURNS**	*VK3DLV*
Highly Commended	**R SHIELLS**	*(Sponsors VK3CAK, VK3KSJ)*
Commended	**B McIVOR**	*VK4EJ*
Commended	**D NOBLE**	*(Sponsor VK7FT)*
Commended	**H WILSON**	*VK3CYL*
Commended	**J MOULDER**	*VK4YX*
Commended	**V TRENBERTH**	*VK3DVT*
Commended	**A MURPHY**	*(Sponsor VK2PMG)*
Commended	**K WILMOT**	*(Sponsor VK3AGR)*
Commended	**D MANN**	*VK3DBJ*
Commended	**V MARSDEN**	*VK2EVM*
Commended	**L McIVOR**	*VK4EJ*
Commended	**M BENNETT**	*VK3AGR*

The members of the Seventy Fifth Anniversary Co-ordinating Committee express their thanks to all entrants, we have not the space to include all names.

We must stress that, as notified in the original notification of the competition (June AR, rule 8) that the final Logo may well be a combination of entries received.

AR

Logo winner Don Burns VK3DLV busy with his other hobby — painting.

Photograph by Ken McLachlan VK3AH

THE FEED IMPEDANCE OF AN ELEVATED VERTICAL ANTENNA

Guy Fletcher, VK2BBF
3/34 Benelong Road, Cremorne, NSW 2090

Part 3: Practical implications and some thoughts on antenna gain

In the previous two parts of this article a detailed expression was derived for the base feed impedance of an elevated vertical monopole antenna over a horizontal ground plane. Graphs were given for the variation of impedance with height above ground for two important practical cases: the ¼-wave and ⅝-wave antennas. In this final part I discuss the practical implications with particular reference to mobile VHF antennas, and give some hints for evaluating the expression numerically on a personal computer. Finally with some temerity I make some important observations on the gain of monopole antennas compared with a dipole.

PRACTICAL VERTICAL MONOPOLES

At the risk of stating the obvious, the effect of the ground has already been taken into account in these calculations, to the extent that it may be regarded as perfectly conducting anyway. No further allowance need be made for it.

A vertical ¼-wave antenna at HF, constructed at ground level, should show a feed impedance close to 36.5 ohms. An elevated HF antenna may still be quite close to the ground in terms of wavelength, so you must refer to Fig 5 (in part 2) to estimate the feed impedance.

Almost without exception vertical VHF antennas are more than a half-wavelength above ground, even those on car roofs. However a car roof surrounding a centrally-mounted whip is both a solid conductor and reasonably extensive. High-angle radiation is certainly reflected, and some low-angle radiation too. We may expect a compromise feed impedance of perhaps 25 to 30 ohms for a ¼-wave monopole. A ⅝-wave vertical is larger in relation to the roof size, so less low-angle radiation will be reflected, leading to a probable base feed impedance around 115 ohms.

It will be noted that both antennas provide a relatively poor match to 50-ohm coaxial cable. If connected directly to such a feeder, the impedance presented to the transmitter will vary between about 25 and 100 ohms (depending on feeder length) for the ¼-wave antenna, and between 115 and 22 ohms for the ⅝-wave antenna. But you cannot just select a feeder length to make it look like 50 ohms because, except at these extreme values, there is a reactive component also.

If an impedance much higher than 50 ohms is presented to your transmitter, it will deliver considerably less power to the antenna. If much lower than 50 ohms, then your solid state final (which actually has an output impedance much less than 50 ohms although designed to deliver its rated output into 50 ohms) will attempt to deliver more than its rated power with possible harmful results. Changing antennas between ¼-wave and ⅝-wave monopoles will give no useful information on the relative radiation of these two antennas because the transmitter will deliver quite different powers to each of them. Furthermore you may get quite different results with a different feeder length. Clearly some further thought and attention is needed to methods of matching at the base of vertical antennas.

PRACTICAL CALCULATION OF FEED IMPEDANCE

The expression given for the feed impedance of an elevated monopole in part 2 of this article obviously cannot be evaluated "on the back of an envelope". The Si and S_1 functions have been tabulated in a few places (4), but accurate interpolation between tabulated values is difficult. The expression is obviously best evaluated on a computer from scratch, using numerical integration methods. A large computer is not necessary. The problem is easily programmed on a personal computer; I have a version running in MBASIC on my Morrow MD2.

A few words of warning for anyone who wants to set up this problem. First the expression $\frac{\sin 4\pi D}{4\pi D}$ will blow up at D=0; a trap must be used to set it equal to 1 in that case. Second, the conversion from R_1 to R_b will blow up when H is a multiple of a half-wavelength since R_b then goes infinite. Include a trap to calculate only R_1 in that case, with an appropriate printed statement to remind you what has been done.

Third, and most important of all, do not try to evaluate the actual Si and S_1 integrals from a lower limit of zero as written. I have written them this way because the functions are so defined. Instead notice that, for example, Si(8πD+4πH) - Si(8 D) is equal to

$$\int_{8\pi D}^{(8\pi D+4\pi H)} \frac{\sin x}{x}\, dx.$$

Direct calculation of this integral avoids the subtraction of two nearly equal large numbers, which always leads to error. Actually the expressions to be evaluated involve the difference between two integrals like the one above. In the numerical integration (using Simpson's rule) this difference itself may be evaluated within the summation.

If any reader is sufficiently motivated to run the calculations without wishing to programme the problem, I would be happy to supply a listing in MBASIC, which includes a character plotting routine which will run on any non-graphics terminal or printer. Alternatively I can transfer the programmes directly to 5¼-inch floppy disc in some formats provided the disc is already formatted — enquire first, with pre-stamped large envelope for listing if required.

ANTENNA GAIN OVER A DIPOLE

I enter this controversial area with some hesitation since so much has already been said by other authors. While the effect of the ground has been fully included in the impedance calculations, its effect as a reflector between transmitter and distant receiver must be clearly appreciated in comparisons between antennas.

Let's start in interplanetary space well away from any possible reflections, and compare a ¼-wave monopole having a ground plane with a simple dipole. Let the same current flow in each antenna. Then in the favoured broadside direction, ignoring any radiation from the radial elements of the ground plane, the field due to the complete dipole must be exactly double that of the monopole, leading to four times the received power. Now against this, the two antennas did not receive equal powers to be radiated. The power radiated by the monopole is $I^2R = I^2 \times 19.4$, and by the dipole $I^2R = I^2 \times 73.1$. The dipole therefore

radiates 73 1/19 4 3 77 times as much power as the monopole giving it a gain advantage of 4/3 77 1 062, or 0 26 dB. This gain is solely due to the s ight sharpening of the radiation pattern of the longer ha f-wave dipole antenna; t may be compared with the gain of 0.39 dB of a half wave dipole over a very short dipole. The very short dipole has a further gain of 1 76 dB over an isotropic radiator

For all practical purposes the ¼-wave monopole has the same gain as a half-wave dipole This is hardly surprising since both antennas radiate in all d rections with a basic sin θ field pattern, only slightly modified by the finite length factor

When the ground is present the question ar ses – *with what reference half-wave dipole is our monopole to be compared?* Presumably w th a vert cal one at the same height above ground, so that interference effects of the image antennas are the same This presents no prob em with an elevated antenna. The answer is the same as in free space. The d pole has a slight edge but only by 0.26 dB. For a pract cal purposes they are equivalent.

Now consider a ¼-wave vertical monopole on the ground Apart from the effect of obstructions, its low angle signal should be identical with that from the elevated antenna, but the interference pattern with its image antenna is broadened to non-existence We have effectively a single half-wave dipole as in Fig 1 of part 1 It is obviously impossible to compare this situation with a real vertical half-wave dipole at the same height, because part of it would be underground! But in any case it should already be clear that the ground-level monopole, an elevated monopole, and an elevated half-wave dipole should all have approximately the same gain over an unobstructed good ground.

Then what has happened to the magic 3 dB gain sometimes claimed for a ¼-wave monopole over a dipole? It never existed The argument for it is based, I think, on the fact that the same power is radiated into only half of all space (above ground level) so the signal should be doubled. This is not a fair comparison since a vertical dipole over a ground has exactly the same advantage, and in free space (interplanetary) neither antenna has this advantage

Finally the ⅝-wave monopole It can be shown that over a perfect ground and for the same total radiated power the field strength due to an antenna of height 0 64λ (which is close enough to ⅝λ) exceeds that due to a ¼-wave monopole by a factor 1 43 due to sharpening of the radiation pattern, 0 64λ is the optimum length and the field falls quickly for longer monopoles (3) This corresponds to a power ga n of 1 43²=2 03, or 3.07 dB

Thus a vertical ⅝-wave antenna whether elevated or not, has a built-in advantage for low-angle radiation of 3 07 dB over a vertical ¼-wave antenna, and presumably 3 07–0.26= 2 81 dB over a vertical half-wave dipole If this advantage is not observed in practice, it is almost certainly due to incorrect match ng of the antennas, and to d.fferent power levels delivered to each by the transmitter

REFERENCES TO PART 3

(3) "Electromagnetic Waves and Radiating Systems" by E C Jordan, Prentice-Hall Inc

(4) eg "Rad o Eng neers Handbook" by F E Terman

AR

A FUNNY THING HAPPENED ON THE WAY TO BALLET

Adapted by Jim Linton VK3PC

An Authentic Story by an Anonymous VK3 Amateur

We re ate it's Sally s ast ballet esson with the six-year-olds and if she misses this one!! *"Sally, your ballet shoes"* shouts the XYL, *"has anyone seen Sally's ballet shoes?"* Clearly this was a time not to get involved

ll s ip out to the car, get t ready and he tow till the cris s resolves tself First decision, should I screw on the ¼th wh p and listen to 2 metres? Cancel that thought we l only be n the car for a few minutes, and 2 metres s never any good n a bal et crisis.

Traffic's heavy, but then it always is when we're running late We cut down beside the railway line in the hope of saving time. I should have guessed it wouldn't be as easy as that!

When saw the f rst man h t the brakes hard He was running well a bit l ke an athlete By the time the second man crossed our bow, my XYL two offspring, the family saloon and I had ground to a halt.

"Stop you swine, he's robbed me . he's robbed me house But the o d man was outpaced from the start He just looked on with that hopeless expression of someone whose castle has been violated

The alleged burglar was fast one hand on top of a f ve foot ra lway fence and he was over just like that. A ready the adrena in was working My head was full of feelings then fear struck me. This guy might have a shooter or a kn fe

I reived the experience four years ago when we came home to a greeting of smashed windows, flapping curtains and an open front door

I I see .f I can watch where he goes, he's not even running any more, wonder .f he s seen me

Even though he s on y about one hundred metres away we I have to go right around the long way to the nexi ra lway bridge.

Where s the 2 metre wh p?

Suddenly we re stopped behind traffic My XYL must be mind reading again, she s out of the door and *winding the aerial onto its base. "This is VK3--- I need help I need someone with a phone and I need the police*

Gosh, what happens if they think it s a hoax call?

"We re following a house breaking suspect. Can someone call the police? this is VK3--- mobile listening"

Sickening silence. Then, *"Roger VK3---, this is VK3--, I'm onto the police. What is your position?"* The awful loneliness had almost vanished.

Another few hundred metres and there he is walking down the footpath This guy is just so casual, strolling down a busy main road, combing his hair How could anyone be so cool?

Now we're in trouble, he's waiting at a tram stop. So where are the police. Too late, the tram's here, we've got to follow it *"Give me more details and your location now"* says my contact on 2 m. *"We re in behind the tram. I can see our friend inside."*

At last a police van . saved. But it speeds right past us. The let-down is terrible. But my contact is still right with us. Now he s asking for the number on the tram. Have you ever checked to see how many useless numbers there are on a new Melbourne tram? He assures me the police have the details and are on their way now Then suddenly there they are. Two policemen in a superbly blue divvy van, and they're coming right towards us on the other side of the road.

Brakes on and I'm out in the middle of the road jumping up and down and waving my arms at them. The divvy van mounts the footpath, doors open and two very large policemen complete with large shooters are beside me in a flash

The hiss of compressed air and the tram doors are open. He's down the back, I know it. After all this what do I do if I can't see him or I can't be sure I recognise him I mean I've just stopped three trams including the ones banked up behind this one and about fifty cars involved in my man-made traffic jam People are hanging out of windows demanding to know what is happening All that and I might just have made the ultimate idiot of myself.

Up into the tram and the passengers can't believe it. A bearded bloke with a rather anxious expression has just leaped onto a packed tram. He's got two police with handguns drawn right beside him. But there he is, just quietly sitting, no reaction, expressionless And boy am I glad to see him!

"This is the man, right here" I'm pointing straight at him, and it s all over He stands with hands above his head, and the policemen haven't said a word. He's searched and handcuffed in just a few seconds.

Twenty minutes later, the constable taking my statement is having a spot of trouble w th a typewriter

My XYL told her story to another constable in a separate room, but before we left a man in plain clothes introduced himself as the Senior Sergeant at that station *"Listen, you did a really great job out there. Pity more people don't do the same thing This gent is helping us with our investigations on about six or seven other house-breakings and we're still discussing matters with him"*

"Here's my card, you've done us a real favour, maybe I can do you and your radio mates a favour some time . you know?"

That earlier sensation of fear had complete y gone to be rep aced with a bit of old fashioned amateur radio pride.

AR

PACIFIC TELEPHONE CABLE SHIP LAUNCHED

A $27 9 million cable ship which will help maintain Anzcan, the new submarine telephone cable system in the Pacific between Australia and Canada, has been launched from a British shipyard.

The Pacific Guardian is being built for the Cable and Wireless company at Swan Hunter Shipbuilders on the River Tyne, north-east England, and is due for delivery at the end of September After completion, the 6,000 tonne vessel will be based in Fiji.

Anzcan will provide a major trunk route capable of carrying 1,380 simultaneous telephone calls between Australia and Canada Also connected to the system are New Zealand, Fiji and Hawaii.

The Pacific Guardian has been designed to handle all types of submarine telephone cables now in service or likely to be in the foreseeable future. She is able to carry up to 1,700 tonnes of cable in three circular tanks and is equipped with a roll damping tank to allow her to operate in stormy seas.

from Information Technology from Britain **AR**

THE WIA's FIRST INTERNATIONAL DX CONTEST — 50 YEARS AGO

G Maxwell Hull VK3ZS,
FEDERAL HISTORIAN

The state of Victoria celebrated its centenary in 1934. The event was generally referred to as — The Melbourne Centenary Celebrations — but according to more recent historians Melbourne was founded in 1835! It was generally believed that John Batman founded the colony; yet others say it was founded by John Pascoe Fawkner or the Henty Brothers.

But who really cares after all these years. The main fact is that centenary celebrations were pursued with great vigour by the community in general. The Government of the day printed a special series of commemorative stamps in denominations of two-penny (Red), three-penny (Blue) and one-shilling (Black). These depicted an aborigine of the Yarra Tribe standing on the south bank of the Yarra River gazing across, spear in hand, at the growing hundred-year-old Melbourne skyline.

Amateur radio was well established in Australian at the time, with strong representation by the Wireless Institute of Australia in every State of the Commonwealth. A decade had passed since amateurs considered the only way to send their signals around the world was by 'relay' from station to station. Shortwave propagation had been developed significantly and the two major countries whose governments supported amateur radio experimentation, had, through the respective representative bodies of the ARRL and the RSGB, already organised overseas DX contests. Until this time Australia had participated in these events but had never run one of its own.

The Melbourne Centenary seemed a good time to do something about it and so the Council of the Victorian Division of the Wireless Institute of Australia formed a committee under the management of Bob Cunningham VK3ML. Rules were drawn up and circulated world wide so that all countries were aware of the — MELBOURNE CENTENARY INTERNATIONAL DX CONTEST.

In launching the contest rules in the March 1934 issue of "Amateur Radio" magazine Bob Cunningham said, *"This will be the first time in history that any Division, or even the Federal Headquarters, of the WIA has staged such a magnitudinous undertaking. We have all been the guests of the W's and the G's often enough and have thoroughly enjoyed their tests. Now it's our turn to offer one in return."*

For a first effort the committee put a lot of forethought into setting out the rules, many of the basic clauses still being utilised in other contests run by the WIA today.

The general concept of the contest was for the world to work VK. Basically the rules were a combination of BERU and ARRL ideas except that Bob and his committee included one or two encouraging extras. To add to the fun of the contest the VK's were to multiply the total of their points score by the number of countries worked, and those outside Australia by the number of VK districts contacted. One point was scored by each contacting station for every 1000 miles between the capital cities of the states of the competing stations, measured by a Great Circle Line.

"What scores are possible with nearly 100 countries to work", Bob said. *"And don't forget that the QRP merchant will get his 'kick' out of the contest too, because the world will be listening for even the 'squeakiest' signal from VK"*, he added.

A section for shortwave listeners was included in the contest. A separate test for receiving stations in all parts of the world was provided for and all were eligible for the awards for that section. This was an encouragement for shortwave listeners to 'go for their ticket'.

In 1934 there was keen interest in the newly developing 28 MHz band. To encourage operation in this area of amateur experimentation bonus points were given for contacts on this band. A lot less was known about the phenomena of sunspot cycles in those days!

Australia — like all other countries — was recovering from the great world depression. Jobs were not easy to get and the pay did not leave much to spare for the high cost of 'wireless' components. It was therefore, with great pleasure, that the committee announced the generous donation of valves and meters from Amalgamated Wireless Ltd, Philips Lamps Ltd and Siemens Ltd. Valve types 800, 852, TC05/25, QC05/25, MC1/50 and E424 were indeed worth competing for! And top quality panel meters were a 'must' in the 'home brew' rigs of those days.

A special Centenary 1934 Contest certificate was printed and the winners in every section received one of these in addition to the coveted prizes. As a bonus, each contestant in each Division of the WIA who returned the highest score for his District (now called Zones), also received a certificate.

The Victorian Division of the WIA provided a prize from "Amateur Radio" magazine for the outstanding station description accompanying a contestant's log. This was finally awarded to VE5BI and details were published in the March, 1935, issue of "AR".

The pre-publicity was excellent. By the time the commencement date was reached the world was agog with expectation. The period of the contest was over the four weekends in October and was the forerunner of the VK-ZL Contest which started in October of 1935 as a result of the success of the Centenary Contest. Details of the contest by Bob Cunningham occupied two pages of QST magazine for October 1934, some achievement for Australia in those days.

It wouldn't be amateur radio if someone didn't have some complaint. Many of the letters of praise written to the committee before the contest included some from would-be contestants pointing out that the 'high power' stations were going to have an unfair advantage over the 'low power' operators. Nothing daunted, Bob and his committee soon fixed that one! *"There will be two 'first'*

Bob Cunningham VK3ML, receiving the AWA Prize of an 852 Transmitting Valve on behalf of the Victorian Division of the WIA in the Studio of 3DB Melbourne. Mr Stan Haworth — Manager of the Valve Section of Amalgamated Wireless Limited made the Presentation.

prizes" Bob said, *"one for the winner of the open event — that is, with unlimited power — and one for the handicap event which is to be awarded on the point-per-watt basis obtained by dividing the points won by the power input in watts."* Everybody was happy.

As anticipated, Australia's first ever DX contest was an outstanding success. The world certainly went after VK. Considering the amateur population of the time the participation would have made any entrepreneur more than happy. Letters came in from all over the world congratulating the WIA and looking forward to a repeat the following year.

Space does not permit listing all the place-getters. Suffice it to say the outright winner was VK3MR, M R (Snowy) Campbell, with 100,320 points. He is still active on the air today.

The presentation of prizes was carried out in the studios of 3DB Melbourne — the "Herald and Weekly Times" station — by Mr J Malone, Superintendent of Wireless at that time. The attendant publicity was a great step forward for amateur radio in Australia.

The council of the Victorian Division during the months of preparation for the contest was composed of the following—

Captain A E Payne	*VK3PP*	*Patron*
Harry Kinnear	*VK3KN**	*President*
J Winton	*VK3XR*	*Secretary*
S Bennet	—	*Treasurer*
Bob Cunningham	*VK3ML**	*Traffic Manager*

MAGAZINE COMMITTEE

Harry Kinnear	*VK3KN**	*Editor*
Vaughan Marshall	*VK3UK**	
Jim Marsland	*VK3NY*	
Len Moncur	*VK3LN**	
Bill Gronow	*VK3WG**	
Bob Cunningham	*VK3ML**	

(*) These amateurs are still actively on the air.

And so at the end of the first and greatest contest Australia ever held its Manager — Bob Cunningham VK3ML - had this to say to the world through Amateur Radio magazine —

"CQ DX CENT" — "CQ VK CENT", have ceased flashing across the world, to lie dormant for 100 years. Never again during our stay on this etherial surrounded planet of ours will we be able to witness another gigantic and mighty successful Centenary contest run by the WIA.

"When we recline in the old lead box, keying horizontally with the left foot, perhaps those will-be hams of tomorrow, a few feet above us, will be viewing one another's faces per medium of television and microwaves.

"But why worry about the next age? We lived for the moment during those thrilling four weekends in October and got the 'kick' of a lifetime.

And so they did! At a time when transmitters (and many receivers) were home built. When a lot had been learned about 'wireless' but there was still a lot of progress to be made. Has it ever changed?

AR

"Centenary Contest" Prize Winner Presentation at the Studio of 3DB by Mr J Malone.

A Two Metre Receiving Converter

Harold Hepburn VK3AFQ
4 Elizabeth Street, East Brighton, Vic, 3187

The advent of Oscar 10 with its long elliptical orbit, has provided a way of complementing the declining conditions on the higher HF bands with a path not affected by the sunspot cycle. To limited licencees (in Australia at least) it has opened up the possibility of truly consistent international communication. Oscar 10 has also brought a need for "better than black box" performance so far as the receiving system is concerned. It is hoped that this article will fill a need in describing an above average converter to allow Oscar 10's two metre downlink to be received on any good HF communications receiver – no matter whether that receiver be a stand alone item or part of the more usual station transceiver.

DISCUSSION

The demands made on a receiving system for two metre satellite work are intermediate between those of terrestrial work and those of moonbounce.

For most purposes a terrestrial two metre path is limited to, say 200 km with each end using, say, 25 watts of output. The Oscar 10 transmitter has an output of 14 watts PEP and, at its furthermost point from the earth is some 40,000 km away, albeit at line of sight. Moonbounce provides reflections from the surface of that body some 400,000 km away, which are in the microwatt region.

Leaving aside the constructional problems and cost factors associated with moonbounce "front ends" there is just no need for such an exotic approach to Oscar 10 reception. More than adequate devices are available for use in the Oscar 10 context.

Gordon McDonald VK2ZAB pointed the way in his description of a 2 metre preamplifier in the June 1984 issue of "AR". This preamp used a BF981 dual gate mosFET having an ultimate noise factor in the region of 0.6dB. Such a preamp used in front of an existing converter of older design would produce a startling improvement.

However, the writer saw the need to design a complete converter that would have the necessary performance and allow any single portion of the two metre band to be received on a normal HF communications receiver. Specifically the design now presented allows the 145.800 to 146.000 MHz satellite band to be tuned with a receiver covering 29.800 to 30.00 MHz.

Whilst the performance of any receiving system can be quoted in many ways the acid test will always be just how small a signal is required to produce usable copy.

Using the convention that the minimum discernible signal is that which causes the audio output of the receiving system to rise by 3dB, this converter, measured on professional test equipment gave an MDS of 0.07 micro volts EMF in a 3 kHz bandwidth.

In practice, using a 6 element yagi (with the reflector missing!) at the end of 30 metres of RG8 coax (a considerably less than optimum antenna system!) this converter used ahead of a TS120V receiver gave copy of the 148.10 MHz beacon at S5 to S7. CW was easily copiable when the S meter had no discernible movement.

With current work in the writer's shack aimed at a much more efficient antenna system and a better (home made) back end receiver, another one or two S points should result.

At the time of writing five prototypes have been made. All gave the same results, ie a MDS of 0.07 microvolts EMF or better in a 3 kHz/50 ohm system. This is equal to - 23 dB (microvolts) or – 136 dBm and implies a noise factor of around 1.06.

CIRCUIT DESCRIPTION

The circuit of the converter is given in Figure 1. In concept it is quite conventional – the performance being obtained through the components used and attention to detail.

A The RF stage

A BF981 dual gate mosFET is used as an RF amplifier. Input from the (50 ohm) antenna is by means of capacitive coupling to a tap on L1. If access is available to laboratory equipment for measuring noise factor (a boon granted to but a fortunate few!) then perhaps a bit more performance could be coaxed out of the RF stage using the system described by VK2ZAB.

The simpler tapped coil was adopted in this design as being much easier to duplicate and to get going with only a tuning wand and an "S" meter. The BF981 requires a current through it of 10 mA for best noise performance and R3, R4 and RV1 are used to set the current to this figure. 10 mA represents a 1.0 volt drop across the 100 ohm decoupling resistor R6. Decoupling of gate 2, the source and the supply needs to be very good and is achieved by using pairs of 1000 pF disc ceramics at these three points. These capacitors are pushed down hard on to the PCB with the earthy ends being soldered to the top (ground plane) surface with an absolute minimum of lead length.

It is of interest to note that the first two prototypes used chip capacitors to decouple G2, S and supply. Substitution of the disc capacitor pairs did not change the noise performance.

Output from the RF stage is through the mutually coupled coils L1 and L2. The 5.6k resistors and the capacitive divider C8/C9 provides an output impedance close to the 50 ohms required by the mixer.

B The Mixer

The writer's experience in constructing HF receivers had shown that double balanced diode mixers possess several advantages over the more conventional active types. They are simple to use, have much improved strong signal handling capabilities and – most important in this context – do not contribute noise to the system. However, these desirable characteristics do require that each input and output port "sees" 50 ohms. In particular the output (IF) port should be so terminated as to present a 50 ohm impedance at all frequencies (the IF itself, the signal frequency, the injection frequency and all combinations thereof). The level of injection from the oscillator is also important.

In this design use is made of a commercial unit, the Minicircuits SBL 1 which is available in Australia and, at the time of writing, is $8.50 + tax. It can be obtained from Daneva Australia Pty Ltd of 66 Bay Road, Sandringham, Vic 3191. The SBL 1 is good to 500 MHz and requires 5 mW of drive from the oscillator.

As indicated above, the output from the RF stage is at 50 ohms. The oscillator input is forced to 50 ohms by the use of a 3 dB resistive pad (R17, 18, 19).

Output matching, and termination at all frequencies is taken care of by the diplexer. This consists of two tuned circuits (L4/C14 and L5/C15) and two 51 ohm resistors (R7, R8). An excellent article on this form of termination, written by Paul Shuch WA6UAM, appeared in the February 1977 issue of Ham Radio Magazine.

A more detailed description of the methods of feeding diode double balanced mixers (DBM's) appeared in the Spring 1977 edition of VHF Communications. It was written by J Kestler DK1OF.

C The Post Amplifier

Normal active mixers usually provide conversion gain (and all too often a lot of noise!) while diode DBM's exhibit some conversion loss – usually around 5-6 dB.

A second BF961 is used as a post mixer amplifier. The input is untuned but the drain includes a circuit resonant at the IF (in this case 29 MHz). Again a 5.6k resistor (R13) and a capacitive tap across the coil (C20, C21) gives an impedance close to the 50 ohms required by most modern receivers.

At the lower frequency of use decoupling requirements are less stringent. Accordingly only single ceramic capacitors are used. The ferrite bead decoupling gate 2 is retained as is the current setting network (R10, R11 and RV2). As in the case of the RF stage the trimpot is adjusted to give a 1.0 volt drop across the decoupling resistor R12.

D The Oscillator

The required injection is derived direct from a fifth overtone crystal operating at 116 MHz. This route obviates the harmonics generated by the more usual method of using a low frequency crystal and one or more multipliers. The circuit used has very low phase noise and no provision has been made for "tweaking" it to an exact frequency.

The resultant ± ¾ kHz uncertainty on the final frequency readout is, in the context of Oscar 10, unimportant.

The transistor used, a 2N5179, has an FT of 1.2 GHz and substitution should not lightly be undertaken. The supply to the oscillator is regulated by means of Q4 – a three terminal 8 volt regulator. It should not be omitted.

L8, C26, C27 and the 30 pF trimmer C28 form a circuit resonant at 116 MHz.

Output is taken from the collector of the 2N5179 via a 4.7 pF ceramic disc capacitor. At this point the oscillator will deliver 10 mW into a 50 ohm load.

The 3 dB pad ensures a 50 ohm input to the mixer and reduces the output to the 5 mW required by that device.

E Construction

The converter is built on a double sided PCB measur-

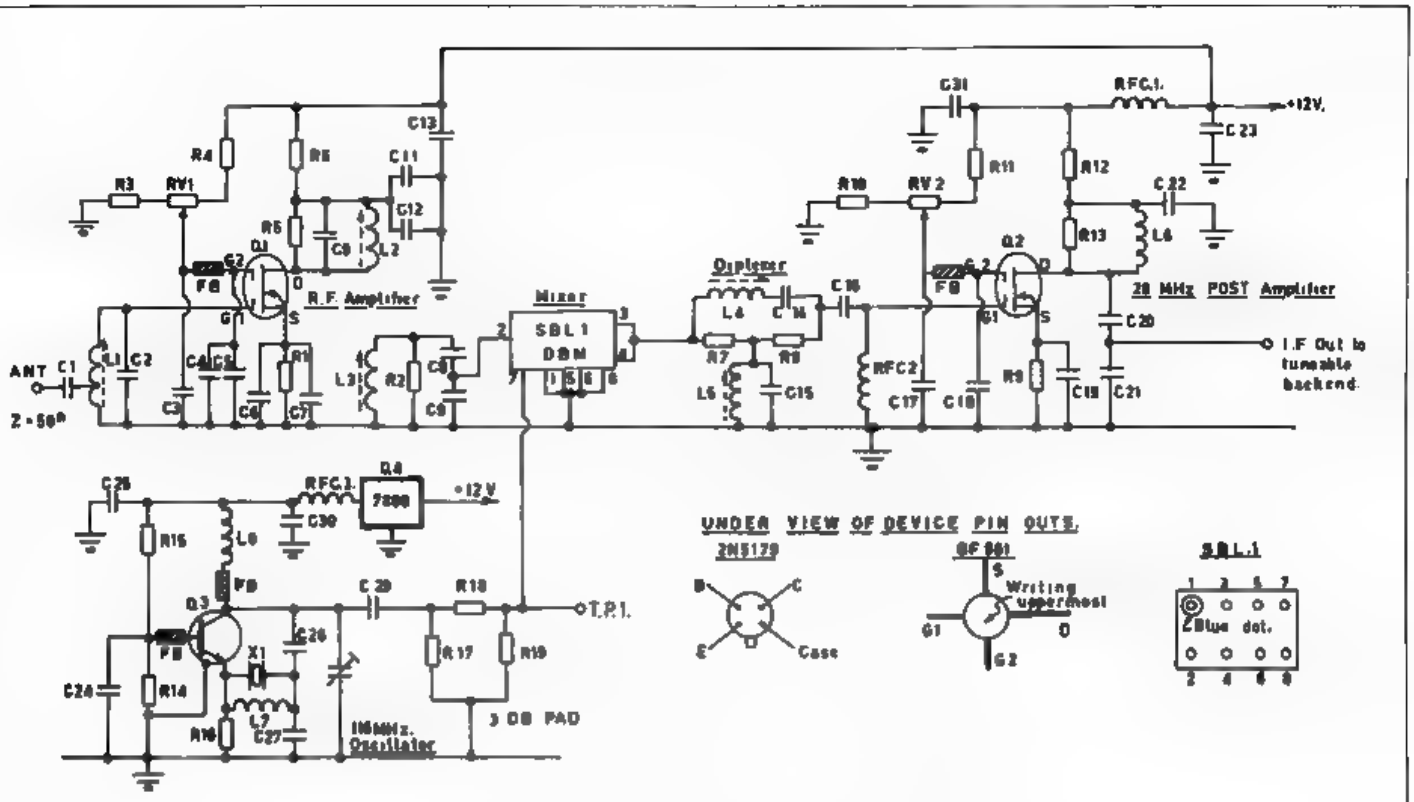


Figure 1 – Circuit of 2 metre Receiver Converter.

COMPONENTS

Q1, Q2	**BF 981**
Q3	**2N5179**
Q4	**7808 Regulator**
R1, R9	**33 ohm**
R2, R5, R13	**5.6 k**
R3, R10, R14	**1.0 k**
R4, R11, R15	**4.7 k**
R6, R12, R16	**100 ohms**
R7, R8	**51 ohms**
R17, R19	**300 ohms**
R18	**18 ohms**
RV1, RV2	**5k Cermet Trimpot**

All Resistors ¼ watt 5% tolerance

C1, 3, 4, 5, 6, 7, 11, 12, 13, 16, 24, 25, 30	***1000 pf Ceramic Disc***
C2, 10	***8.2 pF Ceramic Disc***
C8, 26	***10 pF Ceramic Disc***
C9, 14, 15	***100 pF Ceramic Disc***
C17, 18, 31	***0.01 µF Ceramic Disc***
C20	***56 pF Ceramic Disc***
C21	***470 pF Ceramic Disc***
C19, 22	***0.047 µF Ceramic Disc***
C23	***2.2 µF 35V Tantalum***
C28	***3-30 pF Trimmer***
C29	***4.7 pF Ceramic Disc***
C27	***39 pF Ceramic Disc***

L1, L2, L3– 4¾ turns 20g tinned copper wire spaced over 1cm on Neosid 722/1 Former. F29 slug. L1 tapped at 1 turn from ground.

L4, L5 – 7¾ turns 20g enam copper wire close wound on Neosid 722/1 Former. F29 slug.

L6 – 11¾ turns 20g enam copper wire close wound on Neosid 722/1 Former. F29 slug.

L7 – 5 turns 26g enam copper wire on Neosid ¼" dia F25 Toroid.

L8 – 5 turns 26g enam wire 2.5mm ID air cored. Turns spaced over 5mm.

X1 – 116 MHz fifth overtone crystal.

RFC1, 3 – Wire passing through Neosid F16 tuning slug.

RFC2 – 100 µH moulded choke.

ing 95 x 80mm. The top of the board is used as a ground plane. A 25mm high screen made of double sided, unetched PCB material is soldered across the middle of the top surface of the board. A smaller partition, also 25mm high, is used to isolate the RF stage. Additional shielding is provided by the screening can over L2 and L3.

It will be found that some sequencing of the entry of components to the PCB makes life easier. The two partitions should go in place first. Coils L1 to L6 are wound on the shank of a 3/16" drill and then slipped over the coil formers which have previously been put on to the board. L8 is wound on the shank of a 2.5mm or 3/32" drill before putting in place.

It will also be of assistance to grid dip L4, L5 and L6 (using the appropriate tuning capacitors) while the board is still relatively "empty". In each case adjust the tuning slug to give resonance at 30 MHz.

Those components in the centre of the board which have one lead soldered to the ground plane only, or which are soldered both to the ground plane and earthy tracks under the board, (see Figure 2) are best placed next. This avoids accessibility problems later.

Apart from the above suggestions components can be entered in any sequence. Note that the leads of the BF 981's have to be bent down to go into the board.

F Commissioning

After checking for correct component placement and solder "bridges" etc, set RV1 and RV2 to the centre of their travel. Set C28 so that the plates are about half meshed. Put temporary links between the antenna input pad and earth and between the IF output pad and earth.

Apply a source of regulated 12 volts. Adjust RV1 to give a drop of 1.0 volts across R5 and adjust RV2 to give a 1.0 volt drop across R12.

Put an RF probe (Figure 3 shows a suitable device which is easily constructed and used in conjunction with the station voltmeter) on TP1. Adjust C28 until the meter indicates around a volt. This shows whether or not the oscillator is operating. No go – no volts! Set C28 to the centre of the operating range.

Remove the temporary earthing links at input and output and connect the converter to a source of signal and to a communications receiver. If 144-145 is to be used set the receiver dial to 28.5 MHz (144.5-116.0 = 28.5). If it is the satellite band which is of interest then set the Rx to 29.9 MHz (145.9-116.0 = 29.9).

Note that the FM band (146-148 MHz) will need a receiver covering 30-32 MHz. If conversion from the FM part of 2 m is required then the crystal frequency will have to be changed to 118.0 MHz. No other changes will be needed.

Apply a signal from (preferably) a signal generator. Failing a signal generator, an off air signal will have to suffice. Starting with L6 work backward through L5, L4, L3, L2 and L1 peaking each coil slug for maximum "S".

Note that L5 and L4 are heavily loaded by R7 and R8. The correct settings on all prototypes was with the tuning slugs protruding about 2mm from the top of the coil formers.

No adjustment is required to L7 and L8 if the oscillator is operating.

The converter is now ready for use. Tuning 28-29 MHz will bring in signals in the 144.0-145.0 MHz part of the 2m band. Tuning 29.8 to 30 MHz will bring in signals from Oscar 10 and other satellites. (But make sure they are in sight and that your antenna is correctly oriented – otherwise lots of silence!)

Final tweaking can be done using the Oscar 10 beacon on 145.810 (give or take a few kHz).

G Packaging

It is recommended that the converter be housed in some sort of metal box. For example the unit together with its input and output connections can be put on the lid of an Eddystone 6908P die cast box. Alternatively, a suitable box can be made up from double sided PCB material.

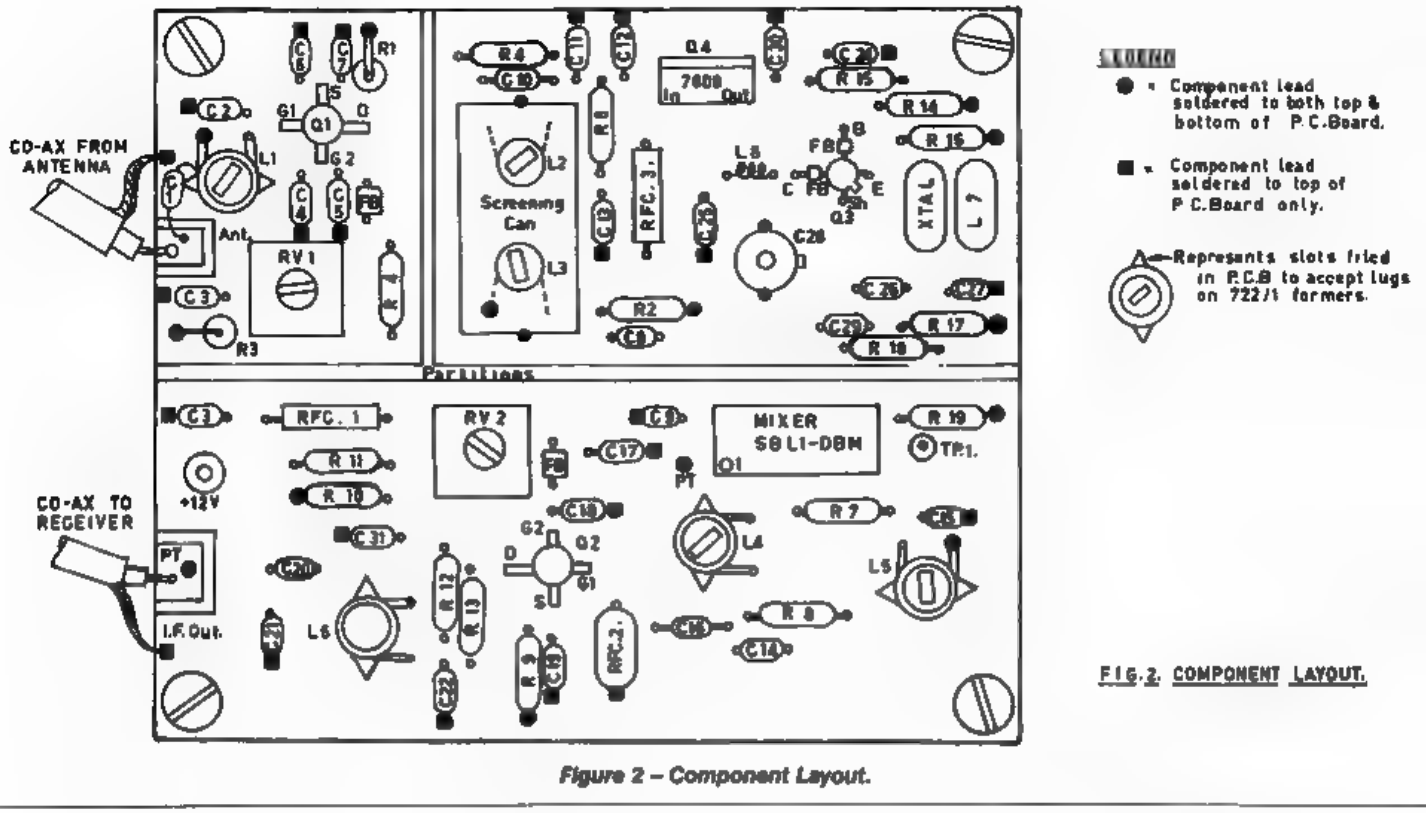


FIG.2. COMPONENT LAYOUT.

Figure 2 – Component Layout.

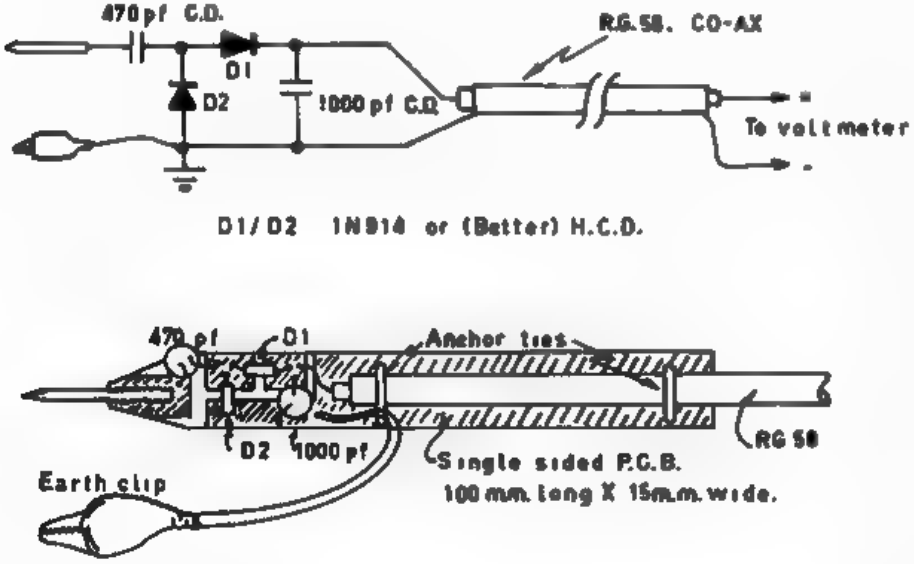


Figure 3 – RF Probe.

H Conclusion and Acknowledgements

At the time of writing the author has made five prototypes. All performed well and some are now in regular use by various amateurs around Melbourne whose main interest is in satellite work.

The Moorabbin and District Radio Club PO Box 88, East Bentleigh, Vic, 3165, have taken up this converter as a project and a kit will be available at about the time this article appears in print. Supply queries should be addressed to them although the author will be happy to answer technical queries. (SASE please.)

My thanks go to Charlie Robinson VK3ACR and Gordon Bracewell VK3XX who got me going on this project and who provided me with much welcomed "user feedback".

Finally nothing could have been quantified without the help of David Rosenfield VK3ADM who provided access to professional test gear during the development stages.

AR

"HEATERS ON" INDICATOR

H J Townsend VK5HT
25 Gosse Avenue, Glenelg North, SA 5045

Having graduated from a solid state transceiver Yaesu FT7, to one with tube finals, a Yaesu FT101ZD. As I do more listening than transmitting I found I frequently grabbed the microphone to answer a CQ, pressed the button and nothing happened. The heaters were not switched on. On other equipment I had used there was an indicator lamp to show when the heaters were on.

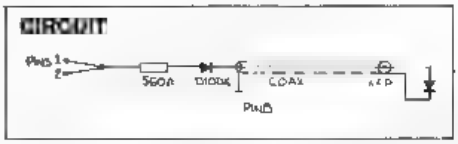
Looking at the FT101ZD front panel there was nowhere to conveniently mount an indicator. I really didn't want to bore a hole in the panel. So I thought why not outboard.

The accessory plug on the rear panel contains a jumper between pins 1 and 2 in the heater line, also an earth, pin 8. There are also several pins with no connection. These made convenient tie points for a resistor, a diode and a piece of flexible coaxial cable.

The cable connected to a miniature LED bezel mounted in a short piece of insulated tube. I used an old coil former for this. This was mounted underneath the APF/NOTCH switch using a clip held in place by the nearest bottom cover screw.

The FT101ZD accessory plug connections are

Pins 1 & 2	*heater jumper*
Pins 3 to 7	*no connection*
Pin 8	*ground*
Pin 9	*Tx ground*
Pin 10	*Rx ground*
Pin 11	*no connection*



The resistor and diode are mounted in the plug. There are probably a lot of other transceivers which could use a heaters on indicator without being mutilated.

AR

AMSAT OSCAR-10 — HOW TO USE IT

G S Bracewell, VK3XX
Warranwood Road, Warranwood Vic 3134

With the sunspot cycle on the decline who can say that DX working on 14, 21 or 28 MHz is consistent or reliable? How about giving 435 MHz a go and using the linear transponder on AO10!. Although DXCC may not yet be workable by way of this satellite it is currently believed that some seventy five countries have been heard or worked with its aid.

You may say that this is only repeater operation with more than one channel. True, but it needs a fairly dedicated effort to get sufficient 435 MHz signal into the device when it is 40 000 km away. For an amateur who has grown up with HF operations there is still a lot to be learned in setting up a VHF/UHF station to effectively communicate through AO10. I found a degree of satisfaction working DX which matched the thrills experienced some thirty five years ago when I was first licensed and used 10 watts of CW into a dipole on 14 MHz.

This is not a "how to build it" article. I hope others may follow up with suitable designs from ideas stimulated by my attempt to define how the various requirements can be met using relatively modest equipment.

TRACKING OF THE SATELLITE

This must be the first priority. If you can't find it, you won't work through it! It helps to own a computer though assistance from others who do will enable suitable predictions to be obtained. Ask around on 2 metres or 70 cm. Someone will be able to help.

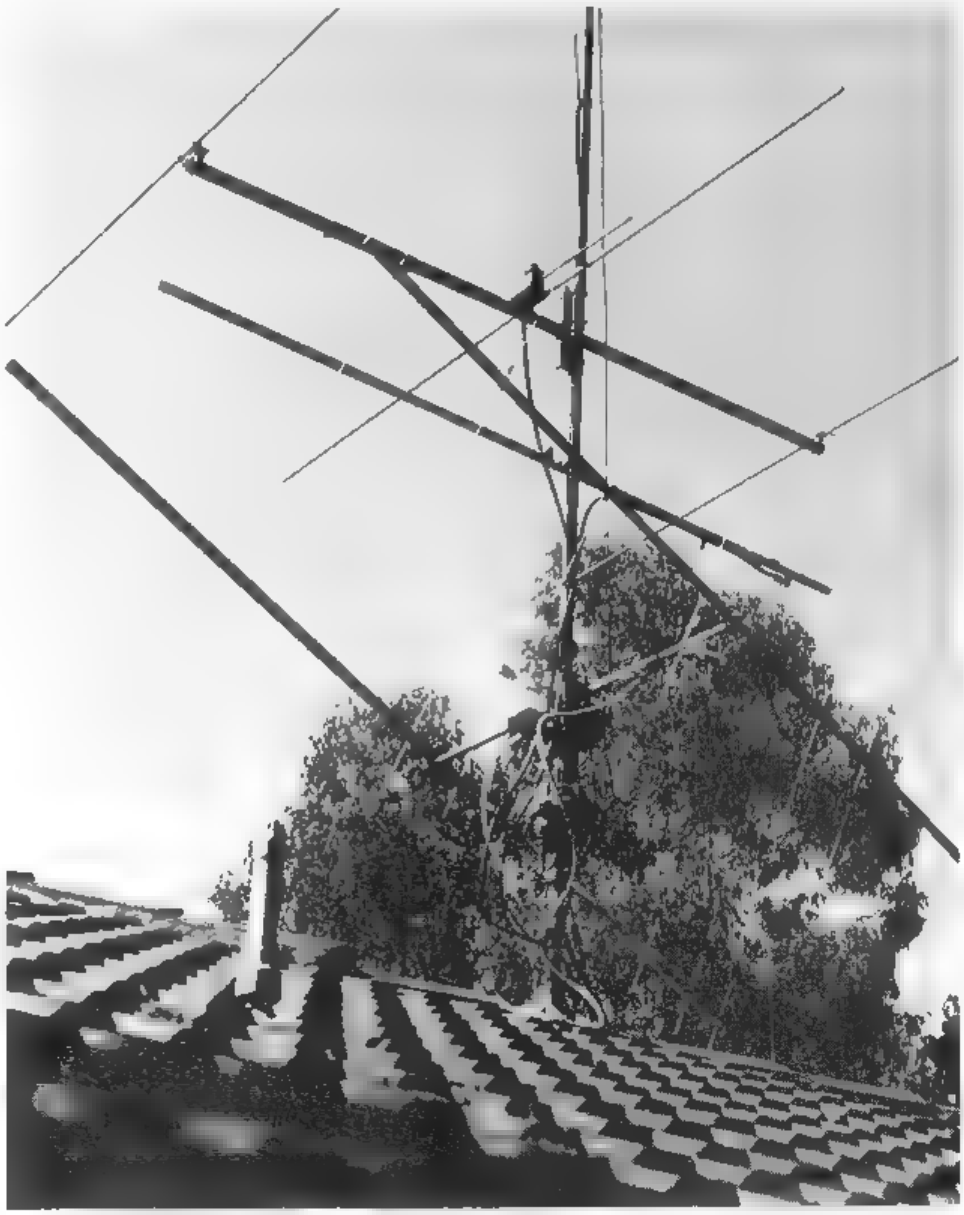
AO10 is in a very elliptical orbit. The height above the earth at perigee (closest approach to the earth) is around 3900 km and at apogee (most distant point from the earth) is around 35 000 km. The maximum range from a given location can be up to 41 000 km. Simple arithmetical calculations which can readily be applied to circular orbit satellites cannot be used in predicting the access times and positions of OSCAR-10.

In the "AMSAT Australia" column of 'Amateur Radio' there is published from time to time data in respect of the apogee. Now the azimuth heading changes very little for the useful portion of any orbit but the elevation changes quite a lot rising to its highest angle relatively soon after acquisition and several hours before apogee and then progressively falling. The best DX is worked at the lowest angles which occur before loss of signal. Times of access vary from two to three hours up to seven to eight hours as the cycle progresses.

If you have a computer but require software then this poses little in the way of a problem. Join in the AMSAT Australia net at 1000 hours UTC on 7 064 MHz in the summer or 3 680 MHz in the winter. A programme can be obtained to run on most popular computers by sending a good quality blank cassette to one of the people who has the programme running on his computer of the same type.

The data required to run the programme are known as the Keplerian elements for the satellite. This information is obtained from NASA, updated from time to time, and is presented on the Sunday night net. The orbit parameters are not changing significantly now so one set of data will last for several weeks. By loading the Keplerian elements for a particular time the programme computes the information listed below for any date and time in the future. It is usual to call for display or print out only when the satellite appears above the horizon of your station. You need to enter the location of your station in latitude and longitude. The display provides:

1. Date and times when the elevation exceeds



0°, usually thirty minute intervals are sufficient

2 *The azimuth and elevation for each time displayed*

3 *The subsatellite point in latitude and longitude*

4 *The range from your station*

5 *The height above the earth.*

6 *The Doppler shift of frequencies from the transponder*

7 *The phase, or a measurement of the position in the orbit*

Having got some basic idea of where and when to look for the satellite the next step is to see what you can hear

THE RECEIVER

The receiver listens to the downlink passband of the transponder — a useful 100 kHz centred on 145.9 MHz. For effective operation maximum attention needs to be paid to the downlink system. I recommend a bit of listening to see how you hear signals compared with others before attempting to transmit. This will provide a feel for operating techniques. When you can hear stations to whom others give weak signal reports then you have a useful downlink.

Inefficient downlink performance encourages operators to use excessive uplink power in order to locate their own signals and excessive power spoils it for everyone because the AGC on the satellite receiver just depresses all the signals within its passband.

As with all VHF receivers there are two approaches —

(1) A crystal controlled up converter with an HF receiver or transceiver

(2) A purpose built receiver such as is found in modern multimods 2 metre "black boxes"

In the case of the former, a basic design would probably use a 116 MHz crystal chain (for 28-30 MHz IF) with perhaps a MOSFET mixer and the best RF stage which can be built. The mixer can use a 40673 or MFE131 but the RF stage needs something a bit special. By far the cheapest low noise RF device (at around a dollar a throw) is the BF981 dual gate MOSFET from Philips. This is available in Australia but is a little difficult to catch. Ask around — sometimes someone will buy a quantity and make them available in small numbers.

RF stages such as a 2N4416A JFET work fairly well but it is difficult to get much below 4 dB noise figure. By contrast, the BF981 is capable of better than 1 dB noise figure with careful adjustment. More valuable to most of us is that by tuning by ear it will yield a better than 2 dB noise figure. Signals from AO10 are not all that strong so the lowest noise figure should be sought.

Using such a converter in front of a modern transceiver on 30 MHz does not create much movement of the 'S' meter on AO10 signals. Most transceivers will stand a little additional gain such that the noise floor just moves the 'S' meter. An IF head amplifier such as a common gate 2N4416 will give 10-15 dB of gain. I like to see the 'S' meter just move off the stop with the converter antenna replaced by a 50 ohm resistor.

If you propose to use a 2 metre multimode transceiver it will be found that most of these are quite deaf though signals will be heard. Most of the transceivers have inadequate overall gain and a noise figure of around 5 dB. So a preamplifier is almost mandatory. Once again the BF981 is prescribed. It will have too much overall gain and stability may be a problem. This can be overcome by building a 3 or 6 dB attenuator pad into the output circuit. It ensures that the output of the preamplifier and the input of the transceiver are correctly terminated. To lose 3 or 6 dB in a preamplifier with a potential for 26 dB is no great sacrifice. Just watch that 'S' meter or those LEDs jump about on local noise you didn't even know was there!

THE TRANSMITTER

As with the receiver, this can be either a transverter driven by an HF transmitter or a 70 cm multimode transceiver. Most commercial equipment available for 70 cm is in the 10 watt or less class. This is quite enough to get acceptable results. If everyone used only 10 watts there would be little need for higher power. Mondays and Wednesdays are supposed to be QRP days with a 10 watt limit to give the lower power boys a chance.

The author uses a FT101Z and a Microwave Modules transverter which delivers 9-10 watts into the feedline at 435 MHz. The uplink passband is 100 kHz centred on 435.1 MHz and the transponder inverts the input signal ie lower sideband on the uplink produces upper sideband on the downlink and tuning HF from the centre on the uplink causes the downlink signal to go LF.

Ten watts into the feedline is more than adequate at ranges up to some 33 000 km to produce a signal strength comparable to the general beacon. This is the criterion which should be sought. However, it must be admitted that the signal is getting a bit thin when the satellite is out at apogee.

The multimode 70 cm transceiver approach is quite straightforward and needs no comment except for perhaps saying that the RF speech processing of modern HF transceivers does help to put a more "solid" signal into the device when using low power. By comparison many of the UHF transceivers sound a bit thin.

What about a linear amplifier? I believe such an addition to the basic equipment is worth having if it is used properly, ie to counter path loss at maximum range and to overcome local losses when the satellite is at low angle — eg power absorbed in trees, houses, power lines etc.

Both vacuum tube and solid state amplifiers are used. Many expensive transistors have succumbed to extensive use since AO10 started operation. Clearly it is vital to watch the VSWR. Vacuum tube linears are more rugged and probably lend themselves better to home construction. There are still some 4X150A, 4CX250B or 2C39 tubes gathering dust and these are ideal though at over $100 for a new tube and $80 for a base, plus the need for a blower, they would not be ideal for someone starting from scratch. Sixty to seventy watts output is all that is required except with very poor antennas. There are those who would say that this is too much but the overall uplink system efficiency including feedline loss and antenna gain (or loss!) has to be considered.

THE ANTENNA SYSTEM

This is the area where there is scope for experimentation and home construction. To the HF operator with his TH6DXX on a fifteen metre or higher tower and its attendant problems with neighbours and the local council, it comes as a pleasant surprise to find that all satellite antennas are comparable in size to TV antennas and are little more conspicuous. Furthermore there is no need for great height — though more about this later. Clearly as with all amateur operation the bigger and better the antennas the better will be results, *but what is really necessary?*

Switchable circular polarisation is desirable but by no means is it necessary. Linear polarised yagis which can be built for $10-20 each are quite suitable. For reception six to ten elements on booms of two to four metres in length will give good results. Obviously the various techniques of getting high gain and large capture area are desirable — eg, by stacking, but this tends to make a totally steerable array (azimuth and elevation), rather more difficult to achieve mechanically.

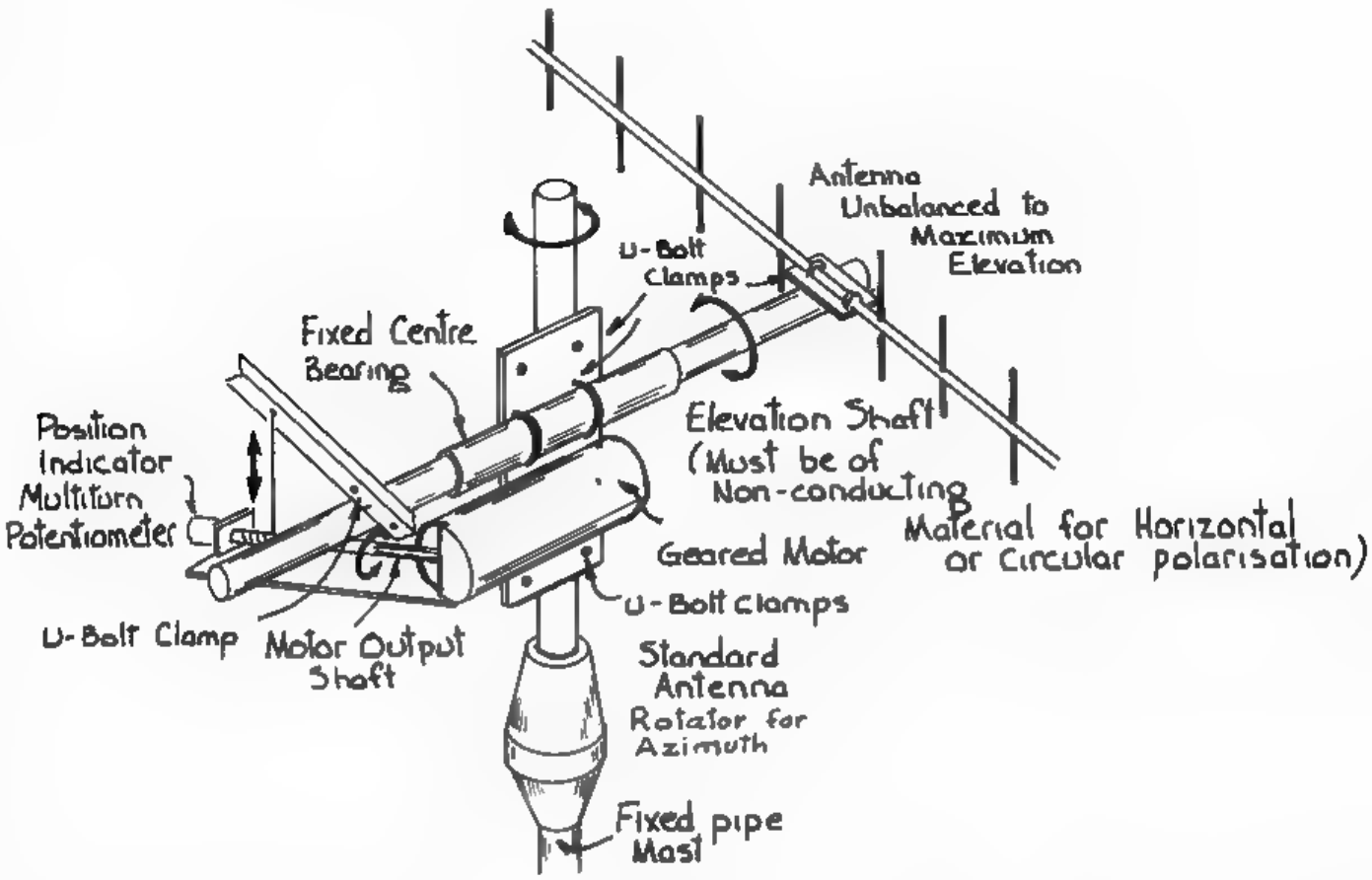
I get excellent downlink results from a horizontally mounted and horizontally polarised ten element yagi at ten metres height for elevation angles up to twenty degrees. Above this elevation, a much lower seven element yagi on an azimuth/elevation mount is superior. This is vertically polarised for convenience of mounting. Use of a good quality feedline with foam or semi-air spaced dielectric is vital. Weak signals have a nasty habit of getting lost in poor quality coaxial cable and it is futile to seek 1 dB RF amplifier noise figure if 2-3 dB are lost in the feeder. There is therefore a compromise between height and feedline loss.

Circular polarisation will eventually be desired to improve downlink susceptibility to rapid fading of signals and for this crossed yagis or helixes are the correct approach. However, linear polarisation is good enough for a start.

On transmit the object is to get the maximum effective radiated power from the antenna system. With 10 watts out of the transmitter on 435 MHz, with typical feedline length, and without resort to the most expensive of coaxial cables, you will be lucky to get more than 5 watts into the antenna. The best 12 mm diameter foam dielectric cable will exhibit about 4 dB loss per 30.5 metres at 435 MHz so once again there is need to compromise between antenna height and feedline loss.

When the original operational parameters of AO10 were published it was expected that 1000 watts ERP would be required for a reasonable level of downlink signal at maximum range. This has now been revised by AMSAT and 500 watts EIRP is now recommended as the maximum. Quite good results can be obtained with 100 watts EIRP but of course signals are going to be down in strength compared with those where higher power is radiated.

Thus, if there are 5 watts at the antenna a gain of 13 dBi is necessary to get 100 watts EIRP. There is a lot of misplaced optimism about antenna gains at 435 MHz so thirteen to fifteen elements represents a good starting point. One of the best designs is the wide spaced NBS design on a three metre boom



Diagrammatic Arrangement for AZ-EL Mount

(Ref 1) for which a gain of 14 dBd for a fifteen element arrangement is claimed

It is easy to copy dimensions for the boom and parasitic elements but matching the driven element is another ball game at 435 MHz A good design (Ref 2) has a three element log period driven element for wide bandwidth and no matching adjustment as reproducing the published dimensions gives a close to 50 ohm match and a claimed gain of 15 dBd.

Check the upper frequency of your trusty SWR bridge. If you are lucky it might be a 150 MHz but it won't be much good for matching at 435 MHz A good SWR bridge which works at 435 MHz is going to cost about as much as two commercially built antennas so perhaps that's the best approach rather than home construction — but you don't learn much!

Let's get back to fundamental detection of standing waves A UHF slotted line (Ref 3) can be built for about $25 and while it is relatively inconvenient to use it is much more sensitive to VSWR below 2:1 than any reflectometer bridge It is of little use for actual measurement of SWR without calibration against an expensive Standard but as a means of adjusting an antenna to the best match of which it is capable it is a very useful and simple device to have around

For HF DX working the axiom has always been a "low angle of radiation". Equally, with the satellite at low angles, the greatest terrestial distances can be covered However, at 435 MHz with low power, local absorption may make the lowest useful angle more than five degrees below which the satellite cannot be accessed Despite this, a lot of DX can be worked even if the antenna cannot "see" below ten degrees so antennas about six metres high will give quite good results and the feedline length is not going to absorb too much power

A means of elevating the antenna as well as rotating it in azimuth is necessary because the satellite can get as "high" at sixty degrees and long UHF yagis (those which have real gain!) have quite a narrow beamwidth. It is not difficult to make an elevation rotator to use in conjunction with a typical commercial azimuth rotator

Gravity can be used to move the antennas one way with a simple motor drive for the opposite direction — eg a simple winch drive as shown in Fig 1 The power required to move a slightly unbalanced antenna is very minute and a bit of ingenuity with a windscreen wiper motor will produce a satisfactory elevation rotator A multiturn potentiometer can be rigged up as a simple position indicator

OPERATING THROUGH OSCAR-10

First get used to listening to the beacon and other signals to get the feel of the devices and tracking with the downlink antenna. The necessary movement of the antenna once the satellite is located is quite small and is mainly in elevation. Remember that the transponder inverts the signals passband.

Initially, radiate a string of dots on about 435 1 MHz (the band centre) and seek your own signal in the downlink on about 145.9 MHz. Peak the antennas in azimuth and elevation for the strongest signal in the downlink

The signal will probably be around S4-5 with 100 watts EIRP if the satellite is close though S1-2 is more likely near apogee. If the satellite is at considerable range you will not be surprised to hear the delay in the return signal. You will find this very distracting and you won't be able to send good Morse by listening to yourself Even speaking and listening to your own voice with a time delay can be very disconcerting at first. To turn down the audio gain on receive while transmitting helps but this tends to lead to traditional simplex operation rather than the true duplex of which the system is inherently capable

Remember that if you can hear your own signal from the transponder that signal will be audible to everyone else whose signal is being "transponded" ie is within access range. To make contact you need to hear someone and to hear your own signal in the downlink Failure to get a reply after calling a specific station when you can hear yourself casts doubt on the downlink capability of the station called — or maybe he just doesn't want to talk to you!

One major limitation of the system is "netting" on frequency The transmission needs to be adjusted in frequency until it coincides with the station to be called. The

result is carriers swishing up and down the passband. With experience, the correct frequency can be spotted within very few kilohertz so only a final, fine adjustment with power on will be necessary.

Most operation through AO10 is SSB with quite a lot of CW the latter giving good results for low power operators. Specialised modes are used effectively though FM is definitely not on.

The position of the satellite follows a definite cycle progressing earlier in the day as the cycles progress. In fact the motion has several distinct cycles. A given cycle will start roughly in the west giving access to Europe and Africa. It progresses through north to about north east when the USA and Canada may be contacted. It will then be unusable for two to three days after which it will reappear in the west.

Currently the transponder is not switched on continuously. Earlier, I mentioned that "phase" determined the position in the orbit. In angular units this is also known as the "mean anomaly". For AO10, Phase is 1 at perigee, it runs out to 128 at apogee and returns to 256 back at perigee. The transponder is switched on from Phase 40 to Phase 216. This corresponds to a minimum height of about 19 000 km so no transponder operation is possible when the satellite is close to the earth around perigee, though the general beacon can be heard on 145 810 MHz at considerable strength during this part of the orbit.

At times a "spin modulation" creates fast fading, making signals difficult to copy. This problem is less marked with circular rather than linear polarisation. If switchable polarisation is available on the downlink it pays to check from time to time which gives the best received signal.

Using 10 watts and fifteen elements vertically polarised on the uplink I have worked thirty three countries, split fairly evenly between SSB and CW, during the first three months of operation. One thing about UHF, TVI and the many other manifestations of interference to domestic equipment are almost unknown.

In summary, OSCAR-10 has opened up new horizons in amateur radio. Give it a go, but don't expect signal levels like 14 MHz. You will be surprised to have solid contacts with signal levels around S3 or less, with reports around S7 when the range is only around 30 000 km and that is with 10 watts.

(1) ARRL Antenna Handbook 14th Edition
(2) "Ham Radio" Jan 1976 "High gain yagi for 432 MHz"
(3) ARRL VHF Handbook

AR

TECHNICAL CORRESPONDENCE

UPPER SIDEBAND BELOW 10 MHz? (OR BETA ON BRAVO!?)

Bob Davis P29ZRD
PO Box 1479, Lae, Morobe

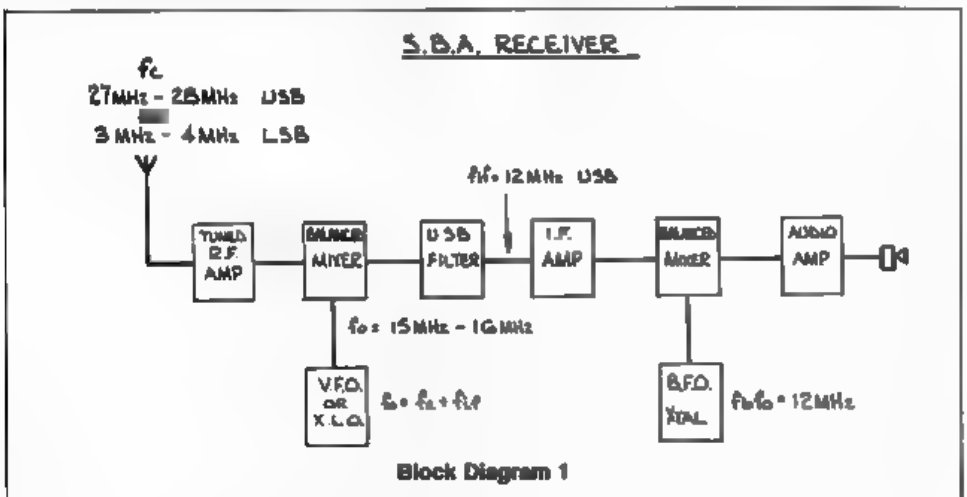
It was suggested at the Federal Convention that the recommended sideband below 10 MHz should be the upper sideband, and that this be pursued with the IARU.

Historically, but unfortunately not in popular amateur usage, the term Sideband Alpha (lower below 10 MHz, upper above 10 MHz) was chosen to describe the normal working condition, with Sideband Bravo (SSB) indicating inverted sideband. Some amateur and professional equipments are designed to take full advantage of this, to the degree that they would need expensive and difficult modification to work on both SBA and SBB, or else become half or fully redundant, depending on band selection.

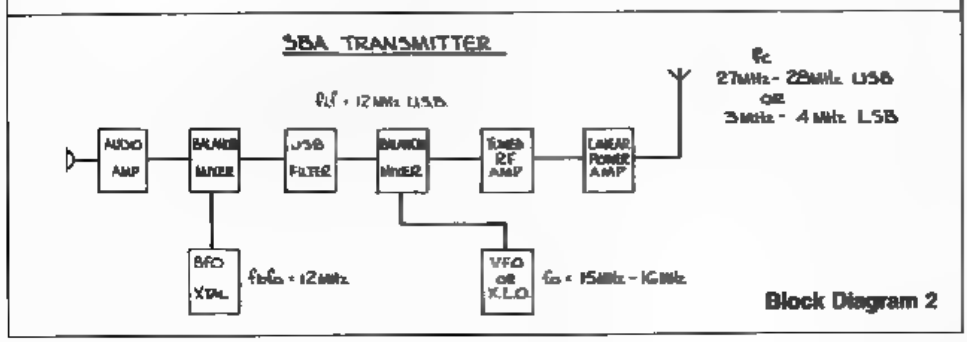
To explain this let's look at a simple design for a Double Conversion Superheterodyne Receiver (Block Diagram 1). A signal in the required band (here 3-4 MHz, LSB) is selected in the RF amplifier and heterodyned with a high frequency VFO (or XLO) in a balanced mixer. If the oscillator is from 15-16 MHz, the result will be an IF of 12 MHz with the signal in the upper sideband. This 12 MHz USB is heterodyned in an identical balanced mixer to the first, with a BFO frequency also of 12 MHz, and Audio is the result. With crystal locked operation, receive clarifiers can be fitted to either oscillator, and the result is very stable.

What happened to the image frequency? With the VFO now on the low side, the image is at 27-28 MHz. If the RF amplifier is now tuned to this range, the receiver will receive these frequencies — on the *upper* sideband. The set stays on sideband A, with no need to fit an LSB filter at all.

This receiver can be changed into a transmitter with basically the same components, plus a linear amplifier. (Block Diagram 2) Straightforward switching can make it into an inexpensive transceiver. The IF at the upper sideband (12 MHz) mixes with the VFO and produces 27-28 MHz USB and 3-4 MHz LSB. The band switch selects the required RF amplifier tuning, and we get our watts to air via the linear amplifier — both on sideband A. You will note that a crystal version of this needs half the crystals of some other designs. (This type of design was frequently used 25 years ago for a 3.5 and 14 MHz transmitter — Ed.)



Block Diagram 1



Block Diagram 2

Changing the band plan complicates this type of design, which is one the home brewer can really put his teeth into, including building IF filters on exotic frequencies if he so desires. It would seem that the advantage of the status quo outweighs any need for change.

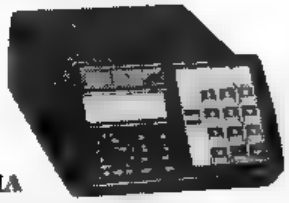
Personal feelings on whether you are proud to be an operator or merely a communicator aside, it is counter productive to have to operate two controls to change bands, and is certainly not a good idea under busy or emergency conditions, where your memory can lapse and you transmit on what in fact is the wrong frequency. As a design feature it makes no sense at all, because with modern sets of both band switched and continuous coverage varieties it would cost virtually nothing to have the mode switch read SBA-SBB or Normal-Inverted in the sideband position instead of USB-LSB. It can be done on many existing sets as a simple modification, although if Murphy is right, those who want it will have the most complicated sets.

If my explanation of why I think the VK3 suggestion will be rejected is true — and I can assure you it is technical and not personal — I have another suggestion.

Amateur equipment manufacturers have never been slow to incorporate features that amateurs have requested before anyone else wanted them — some that are quite expensive. Modification of the mode switch would cost almost nothing. We should ask some of the better manufacturers to make a trial run of sets with modified mode switches. Give these a good test with some active amateurs under all working conditions, and if it proves popular — and I'm certain it would be for the reasons stated — mass production would surely follow, with very little nudging from WIA, IARU, and other interested organisations. Since this would leave the spectrum as it is, it should meet very little opposition and it would also cheer those operators who would have to do a lot of hard work and spend money to use their beloved equipment below 10 MHz on USB.

AOR

AR2001 SCANNER



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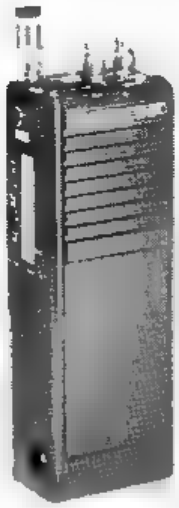

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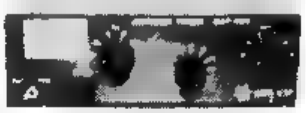

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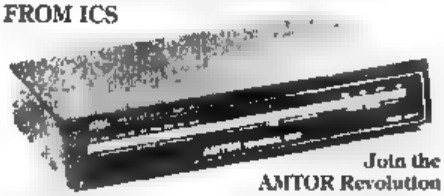

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THE CALL BOOK STORY

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic 3131

The latest Australian Radio Amateur Call Book sees the publication by the Wireless Institute in its thirtieth year.

It was the irregularity with which the PMG's Department had released an official Call Book which led the WIA on a path of taking over the publication.

The Institute's Federal Historian, and former Federal Secretary and President, Max Hull VK3ZS (an executive member for eighteen years), remembers complaints from members about the lack of an updated Call Book. He said the PMG's Department began producing a Call Book in the post World War 2 period with books being released in 1946, 1947 and 1948. But coming out through the government printing processes the Call Books were far from complete, which resulted in complaints from radio amateurs who were omitted.

Later others were unhappy that there had not been a Call Book for a number of years. *"It occurred to me to ask the PMG's Department why we (WIA) couldn't print the book under some form of licence.*

"I visited the then controller of radio Len Pearson (now deceased) and he agreed," Max said.

Max has always suspected since the PMG was only too happy to be relieved of the work involved in the Call Book. They decided in May 1953 to call a public tender for the Call Book and in October of that year the WIA Federal Executive was informed it had the successful tender.

Work was started on the Call Book with Max Hull getting a friend to do the cover artwork for the first edition.

The design, using the colors red, black and blue, featured QSL cards for VK1WI (VK1 was then assigned to the Antarctic), VK2WI, VK3WI, VK4WI, VK5WI, VK6WI, VK7WI and VK9WI. The WIA advertising representative in 1953, Miss Beatrice Touzeau was assigned to solicit ads for the Call Book which helped offset the printing costs. Book shops were surveyed to determine the cover price which became four shillings and sixpence.

In 1953 the WIA Victorian Division publications committee was co-opted by the Federal Executive to handle the Call Book printing and distribution. The Richmond Chronicle, printer of AR magazine for many years, under the guidance of Ron Higginbotham VK3RN, also printed the Call Book for the Institute.

In April 1954 the first copies of the Call Book came off the presses and were bound ready for distribution. Federal President at the time, Bill Gronow VK3WG in the Call Book's foreword said it was hoped the new publication would meet a real need. He predicted it would be invaluable to those who uphold the age-old tradition of regularly forwarding a QSL card upon completion of the first QSO with another amateur station.

Max Hull said there were some early Call Books before the PMG books, including one printed by the WIA Victorian Division in 1914 which included marine shipping callsigns. There was another list produced in the early 1920s for an exhibition in Melbourne by the WIA when radio broadcasting was just starting.

"In those days the public looked to the Institute and the amateurs rather than any professionals because broadcasting had only just begun — the amateurs had been broadcasting for years," he said.

But there were other lists published in magazines like Wireless Weekly (later Radio & Hobbies — now Electronics Australia), and Evening News Handbook. While lists of callsigns also appeared in periodicals such as Radio Broadcast, and Australian Radio World — some

THUMBNAIL SKETCHES

Alan Shawsmith, VK4SS
35 Whynot Street, West End, Qld 4101

CHARLIE MILLER, VK4QM

Charlie first obtained his ticket in Brisbane in February 1933, thus giving him the rare distinction of belonging to the OOT Half-Century Club. His first call was VK4US, which made him a member of the illustrious 'U' gang prominent in Brisbane in the 1930s. In 1935 he moved QTH to Casino NSW where he was to remain, apart from the war years, until 1966. It was from here that he became internationally famous as a DXer, using the call VK2ADE. Charlie then retired and moved to Caloundra on the Sunshine Coast, using firstly the call VK4CM and VK4QM.

During his half-century of activity he pursued many interests. Originally an excellent homebrewer, he went on to achieve distinction in contests and DXing; he also participated in WICEN. Now, of course, he takes it easy and mostly rag chews. He recalls getting on air using a UX99 Hartley oscillator and an OV1 receiver (for the uninitiated this is a detector and one audio). Prior to this he used the rig of Bill Chitham VK4UU to practise up on his Morse — spending many hours working DX while the 'U' gang boys played poker in the background.

Charlie's contesting and DX achievements are far too numerous to mention here but probably his best effort was TOP WORLD in the CQ WW CW section in 1956 — this is a tremendous accomplishment as VKs are not in the best geographical situation to win such an event. His war service was longer than usual, being six and a half years in the RAAF in communications in UK and VK.

Charlie recalls that the esprit de corps in AR in the pre-war eleven days was strong indeed. As an example, he cites the manner in which he got on air. *"Bill 4WD and Jack 4JF taught Morse, Bob 4RB helped with the theory, Bill 4UU (as mentioned above) gave free use of his rig, Pat Golden (call not known) supplied a Philips B Eliminator, Frank 4JU supplied a 245 transmitting tube and someone else home wound a power tranne; 4WD also donated a copper tank coil and 4JF a PMG key"* So, getting on air was really no trouble for Charlie.

An eyesight problem now prevents him from doing many things but he can still be heard on the HF bands so, keep an ear out for him and give a fair dinkum OOT of international repute a call.

AD

KEITH SCHLEICHER, VK4KS

Keith commenced his electronic career as an assembler and wirer in the then very progressive radio firm of Music Masters, Brisbane, in the early 1930s when he was still in his teens. This introduction to radio was followed by an eleven year stint (broken only by two years in the Army in WWII) in charge of the service department of Trackson Bros, Brisbane, another expanding retail electrical store (1935-1946). Keith then went into business on his own account in retail sales and service (1946-1950) after which he joined the technical department of DCA (1950-57). Leaving DCA, he entered into a business contractural arrangement with both Black and White and Blue and White Taxi Cabs where he was responsible for the design, introduction and engineering of the first multi-channel (six in all) two-way radio taxi units in Australia. He finally retired in 1965.

His amateur accomplishments were just as impressive. Like most OTs, he started with a homebrew receiver — a three tube TRF using 58, 57 and 59 valves, written in those days as 1V1 — which he soon replaced with a homebrew superhet. In the late 30s, when the average amateur worked his DX from a dipole or some wire array, Keith had a four element homebrew yagi up sixty-six feet. As aluminium was extremely difficult to obtain pre-war, he used copper-sprayed iron tubing instead (theoretically, polished copper improved performance in conductivity and the skin effect). Power in those days was 50W input and AM phone.

of these short-lived publications were also the official organ of the WIA.

The 1954 Call Book had about 2,100 callsigns — compared to the 1984-85 book with more than 15,000. The Call Book has grown not only in relation to the increased number of callsigns but the latest edition contains updated and new reference material. This includes band plans, VHF/UHF Repeaters, Packet Radio, Australian Third Party Traffic Network, WICEN, ALARA Intruder Watch, Ionospherics, Shortwave Listening, DXCC List, EMC, Satellites, and Australian Awards.

Everyone wanting an easy to read reference manual of material concerning amateur station operation, and would like to have an up-to-date list of VK and P29 callsigns — cannot afford to be without the new Call Book.

Copies of the 1984-85 Call Book with its distinctive full color cover depicting various aspects of our hobby are now available through the WIA Divisions and Magpubs, Box 300, Caulfield South, Vic 3162.

AR

Photograph by Ken McLachlan VK3AUH

Right: Federal Historian Max VK3ZS compares the sizes of the 1954 and 1984 Call Books.

His DX ability kept him always up with the top few; he was among the first to pass the 300 countries worked mark on what today would be regarded as QRP. A member of the WIA since 1935, he was President of the Queensland Division for the year 1947 and, together with Bob Campbell 4RC, instigated the Disposals Department which is still going today thirty seven years [redacted].

Keith can still be heard, occasionally pushing through a pile-up but now he mostly takes it easy as there is nothing much left to work. He was very efficient in everything he undertook, both professionally and in amateur radio; and, in this writer's view, has rightly earned the title of 'the quiet achiever'.

Photo shows Keith VK4KS working DX the easy way — or is he easing an aching back!

AR

CLAUD PAUL SINGLETON, VK4UX

Claud recalls that before he managed to get out of short pants the magic bug of wireless had bitten him good and hard. This and music have been the consuming passions of his life — although he admits the latter interest was originally forced on him by doting parents, rather than by his own volition.

After experimenting with any bits and pieces of 1930-type gear that he could lay his hands on Claud finally took out his AOCP in 1935 and went on air in March 1936 using a battery driven 210A — which was true style QRP operation. Claud says he was never a pirate but admits the reason was probably lack of opportunity, which in turn was due to insufficient cash in hand to purchase those few remaining bits and pieces. In fact, getting VK4UX on air was an exercise in ingenuity and persistence. Green stamps were a scarce commodity in those days, especially for a country boy, consequently everything that could be homebrewed — was.

This writer clearly remembers the 'Voice of Theodore' as Claud became known in 1936 and later. The use of QRP did not stop VK4UX putting an S9 signal into Brisbane on 40 m — and many enjoyable QSOs on AM resulted. Claude's next move was to the 'big smoke' — (if you could give Rockhampton that title in the 1930s) and here his talents in radio and music provided him with a much better income than anything offering out west.

He was following the same vocation in Bundaberg when WWII was declared and he enlisted and did the usual 'stretch' of four and a half years. Post-war he joined the PMG (later Telecom), obtained his BOCP and served on various radio and TV stations throughout the State of Queensland. He ended his career as Officer in Charge of 4RK Rockhampton. In Claude's own words, *"I had come full circle — 4RK was the first station I managed to hear as a kid and I ended up in charge of it.*

VK4UXs membership in the WIA goes back a long way — almost fifty years. In 1936 he was providing news for the VK4 Division. He has also created two successful AR clubs — at Ayr in North Queensland and Dalby. Claud has always been ready to perform as an ambassador for AR, invitations to speak at any club or gathering were seldom turned down. He pays tribute to OOTs, Hal VK4DO (now SK), Vince VK4VD, Col VK4CD, Eric VK4EC, Joe VK4CL, who all helped him to obtain his AOCP.

VK4UXs life typifies the country boy who 'made it' under his own steam. The 'Voice of Theodore' is now the 'Voice of Gatton', a quiet town in the picturesque Brisbane Valley where Claud has retired to enjoy both music and AR.

AR

QSP

PACKET RADIO ENTHUSIASTS

Gateway: The ARRL Packet Radio Newletter is published by the American Radio Relay League, 225 Main Street, Newington, CT 06111.

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AR

Amateur Graffiti

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contributed by Heinz Baylala VK3BEW

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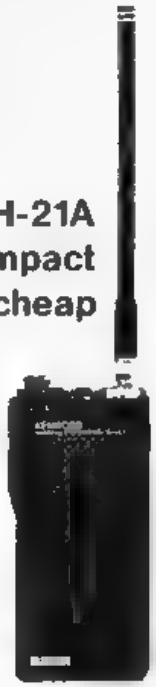

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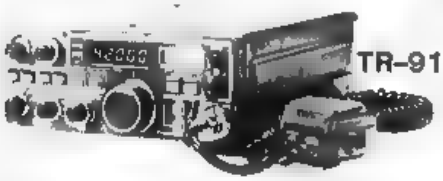

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GUINNESS BOOK OF WORLD RECORDS

Through the selection of a segment of the QSO records achieved by Dick Spenceley KV4AA, amateur radio has been awarded its first entry in the *Guinness Book of World Records*. The April 1984 edition of this prestigious chronicle of human achievement records the following in the section on radio broadcasting, page 262.

"*Most Assiduous Radio Ham* Richard C Spenceley (d July 30, 1982) of KV4AA at St Thomas, Virgin Islands, built his contacts (QSOs) to a record level of 48,100 in 365 days in 1978."

An effort had been made by Howard W Mehrling W4HN, and others to have the entry expanded to include Dick's single operator total of 203,100 QSOs achieved in a 6½ year period without the use of automated calling devices. However, Guinness selected the single-year segment for record purposes. Mehrling reported that Amateur radio accomplishments involve so many qualifying statements that it is almost impossible to meet the Guinness standards of acceptance. However, the KV4AA file is well supported with substantiating facts."

Dick Spenceley was one of the world's most prominent DXers during the 1950-1960 period. He served as DX Editor of *CQ* magazine from 1951-1957 and was the originator of *CQ's* WPX Award Program. In the 1960s he introduced Danny Weil, VP2VB, and YASME to amateur radio, beginning one of the greatest worldwide DXpeditions in history. The YASME Foundation still exists today. He was selected by the CQ DX Awards Advisory Committee to be the fourth member of the DX Hall of Fame on March 1, 1969.

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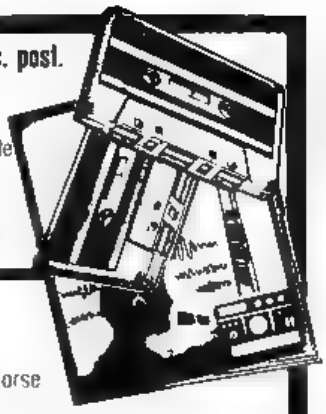

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AR SHOWCASE

ITEM IN ERROR

An "AR Showcase" item in Amateur Radio, September 1984 reported that GFS Electronic Imports had decided not to handle the JIL SX-400 Scanner and detailed reasons profferred by that company for its decision.

The report indicated that GFS had decided not to handle the SX-400 as it "came nowhere near the standard required of Commercial or Military quality programmable scanning receivers" and detailed faults reportedly detected by GFS in the SX-400 receiver.

Further information supplied by Vicom Australia Pty Ltd has indicated that some of the information in this item may have been incorrect and misleading.

Japan Industries Limited has advised that independent evaluation of the receiver in Australia has failed to support the complaints made in the item.

J.I.L also advises that the SX-400 is now in full production and that there are large numbers on back order from Government departments in Australia, New Zealand and overseas.

Pending a full report from J.I.L, to be published in the next issue, Amateur Radio advises that the report headed "Not to Handle the SX-400 Scanner" appears to have been in error and apologises to Japan Industries Limited and the Australian distributor of the SX-400, Vicom Australia Pty Ltd.

AR

1984 FOREIGN AND US AMATEUR RADIO CALLBOOKS

GFS Electronic Imports recently announced the availability of the latest 1984 United States and Foreign amateur callbooks. Each callbook lists over 410,000 licensed amateurs as well as a wealth of other information of interest to amateurs and short wave listeners alike.

Likened in size to a Sydney or Melbourne telephone directory each callbook includes such information as, *QSL managers, world amateur radio prefixes, Great Circle bearings, international postal rates, standard time charts, Worldwide QSL bureau's as well as a census of amateur radio licenses in the USA and the world.*

The US callbook lists only amateurs resident in the United States while the Foreign callbook lists those in the remainder of the world. Price of the US callbook is $32.00 plus $6.00 P&P, the Foreign callbook is $30.00 plus $6.00 P&P.

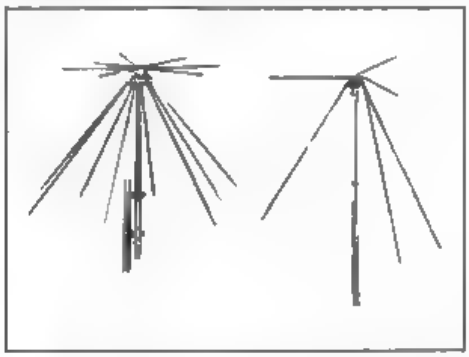
For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Victoria, 3132 or PO Box 97. Telephone: (03) 873 3777

AR

BROADBAND OMNI-DIRECTIONAL ANTENNAS

GFS Electronic Imports, have announced the availability of two broadband, vertically polorized, omni-directional antennas. Known as the GDX-1 and SCAN-X, both models are Discone type and designed for operation within the VHF and UHF bands.

The model GDX-1 covers a frequency range of 80 to 480 MHz continuously and is suitable for both transmission and reception applications over these frequencies. It will also operate quite satisfactorily over a wider frequency range when used for reception only. Overall height of the GDX-1 is 1 metre while its weight is 2.6 kg.



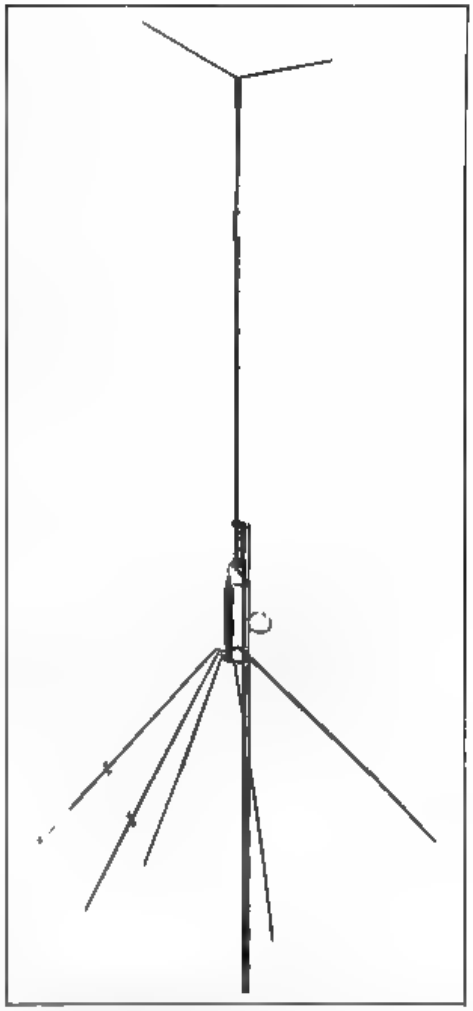
The SCAN-X continuously covers the frequency range 65 to 520 MHz and is designed for receiving only. Its main application is as a base station antenna for programmable scanning receivers such as the SX-150 or SX-200. Both antenna types provide a gain of approximately 3dB over a quarter wave ground plane.

Price of the GDX-1 is $105.00 plus $12.00 P&P while the SCAN-X is $67.00 plus $12.00 P&P. For further details contact GFS Electronic Imports, 17 McKeon Road, Mitcham, 3132 or PO Box 97. Phone (03) 873 3777.

AR

HF TRAPPED VERTICAL ANTENNA

An amateur trapped vertical is usually an easy antenna to accommodate although some would have difficulty finding space for the 18.3 metres long 80 metre wire radial with which most are equipped. Now available is the HF 5 band amateur vertical antenna which overcomes this problem.



Known as the HF5-DX it is a fully self supporting antenna which makes use of its own self supporting loaded radials. The entire antenna sits neatly up in the air looking rather like a 5/8 wave ground plane. Its maximum radial length is approximately 1.9 metres while the length from its tip to the bottom of its radials is approximately 7.6 metres.

Rated at 150 watts PEP the HF-5DX will handle any of today's modern solid state transceivers quite happily.

Price of the HF-5DX is $200.00 plus $12.00 freight. For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Victoria, 3132 or PO Box 97. Phone (03) 873 3777.

AR

BEST PHOTOGRAPHS

The judges selected the collection of photographs by Bud Pounsett VK4QY, page 58, of the September magazine.

Bud is now eligible for the Agfa-Gevaert prize of film and videotapes to the value of $100, at the conclusion of the competition, June magazine 1985.

Photo left: As promised last month — page 20 — we now have a photograph of Ivan Hüser VK5QV accepting the Optima Camera Outfit from George Gilbert, Agfa-Gevaert's SA Representative. Ivan won the camera for the best photograph for the 1983–84 Photographic Competition.

NOVICE NOTES

Ron Cook, VK3AFW
Technical Editor

THE VERSATILE WIRE

WHY A WIRE?

There are many better antennas than a random piece of wire yet for temporary, portable or emergency operation nothing is simpler (or cheaper) than a piece of wire. Further, by selecting the right length, useful directional patterns and some gain can be obtained.

HOW LONG?

If a wire is a half-wave long and fed at the end it exhibits a high feed resistance. This is an advantage as in portable operation etc an efficient earth is often difficult to arrange. For multi-band operation it would be advantageous to retain the high impedance feed, hence the wire should be an integer number of half-waves long on all bands if possible.

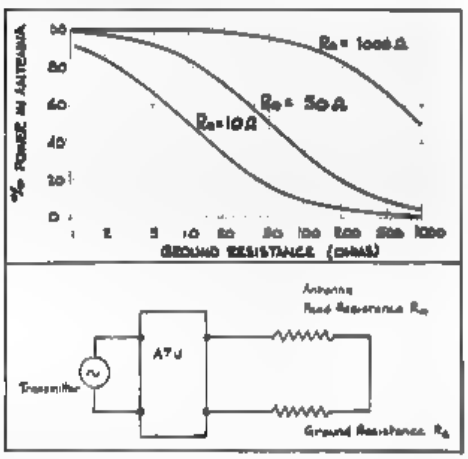


FIGURE 1: Antenna Power and Ground Resistance.

Transmitter power is shared between the ground resistance and the antenna feed resistance. For good efficiency (most of the power being fed into the antenna) the antenna feed resistance should be ten times the ground resistance. Note that the feed resistance is different from the radiation resistance. The feed resistance is high for voltage feed points and low for current feed points. The ATU provides a match for the transmitter.

Fig 1 shows that the antenna feed resistance appears to be connected in series with the ground resistance. The ground resistance depends on the length of the pipe you have driven into the ground as well as the moistness and chemical composition of the ground.

Obviously the power that goes into the ground resistance merely makes the ground a little warmer: it is the power that goes into the antenna and (hopefully) radiates that is useful. Thus we want to keep the ground losses as small a percentage as possible of the total power. As we see in Fig 1 a high feed resistance, say 1000 ohms, allows use of ground resistances as high as 200 ohms while keeping a high efficiency. Obtaining an RF ground less than 10 ohms is not always possible.

For this reason an end fed antenna can give a very good account of itself if the feed resistance can be kept high by always using it on a half-wave or multiple of a half-wave length.

Losses such as those due to the resistance of the wire, or due to the ground in the near vicinity of the antenna, or due to absorption in other nearby objects have been neglected.

The resonant length, L, of a wire which is one or more half-waves long is given by:

$L = 150(N-0.05)/F$ metres

Where N is the number of half-waves
and F is the operating frequency in MHz.

The shortest wire that the novice might be interested in is 2 wave-lengths long on 10 m and 1.5 wave-lengths long on 15 m. This is also a 1/4 wave-length long on 80 m, 0.5 wave-lengths on 40 m and a full-wave on 20 m. If space was available the wire could be made twice as long so as to maintain a high feed impedance on all bands. For this article we will consider the shorter wire in detail.

Taking 21.150 MHz as the design frequency we calculate the length as 20.92 m. The nominal resonant frequencies on the other bands are:

28.32 MHz
13.98 MHz
[illegible]
3.40 MHz

These frequencies are below the amateur bands for the bands below 21 MHz. This is not of any practical significance.

MATCHING

An ATU will of course be required to match the high impedances on 10 m and 15 m to suit the 50 ohm output of the transceiver. An impedance of 1.5 kohms would be typical. The ATU of course enables the wire to be resonated on any operating frequency.

On 40 m and 20 m the antenna will be a high impedance but on 80 m the impedance will be low. The low impedance or more correctly the low feed resistance means that the antenna's efficiency will be lower. This occurs because some transmitter power will be lost in the earth and as the feed resistance falls more power will be lost. This is illustrated in Fig 1.

Apart from the length the most significant factors affecting the feed impedance are the wire diameter and the height above ground. A pi network will probably work well on 80 m and an L network should be effective on all other bands. The components need to be selected to handle the transmitter's power.

RADIATION PATTERN

The Figures 2 to 5 give the approximate horizontal radiation patterns from our 21 m wire when used on 40, 20, 15 and 10 m respectively. The pattern on 80 m is almost circular without any significant directional properties. All the patterns show that when a wire is fed from the end the pattern is slightly different to the centre-fed case. The pattern is pushed slightly away from the end at which the feed is connected. A centre fed antenna has a symmetrical pattern.

Fig 2 shows that on 40 m there is a noticeable null off the ends of the wire. On 20 m there is a deep null at about ± 90 degrees and the null off the ends has deepened (see Fig 3). Optimum signal strength is for stations aligned at about ± 40 degrees to the ends.

On 15 m there are two deep nulls on each side and again the maximum signal is at about ± 40 degrees. This is illustrated in Fig 4.

On 10 m the pattern exhibits noticeable forward gain at angles of about ± 25 degrees and there are three deep notches off each side.

If multi-band operation is contemplated then the best compromise would be to align the wire at an angle of 30 degrees to the preferred direction. Remember that there will be two directions each with short and long path. So aligning for short path Europe also gives long-path to Europe, plus short path to Alaska, South America and South Africa. In Melbourne this would mean

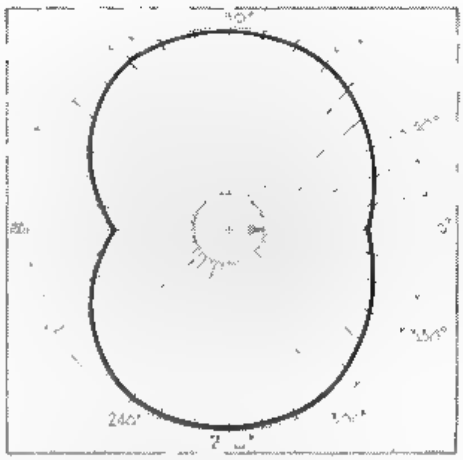


FIGURE 2: Directive Pattern of a Horizontal Half-Wave End Fed Wire.

A 21 m long wire would have this pattern on 7MHz. The wire is assumed to run along the 0-180 degree axis and is fed at the 180 degree end.

L= 492 (N-0.05)/F (ft)
L= 150 (N-0.05)/F (m)

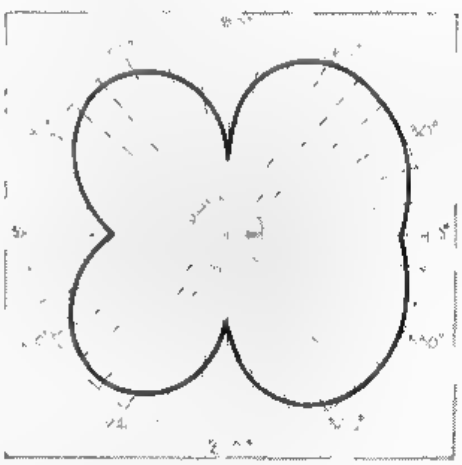


FIGURE 3: Directive Pattern of a Horizontal One-Wave End Fed Wire.

A 21 m long wire would have this pattern on 14MHz.

alignment along 110/290 degrees east of north.

A directional pattern implies gain, and, given a pair of supports of reasonable height and an absence of nearby trees, metal roofs etc, a gain similar to a two element beam can be attained on 10 m and a little less on 15 m.

THE EFFECT OF HEIGHT

A typical height might be 5 m which is a long way short of the minimum desirable height of 0.5 wave-lengths except on 10 m. Thus the free-space radiation pattern will be very much modified in the vertical plane, due to ground reflection. On 80 m and 40 m most of the

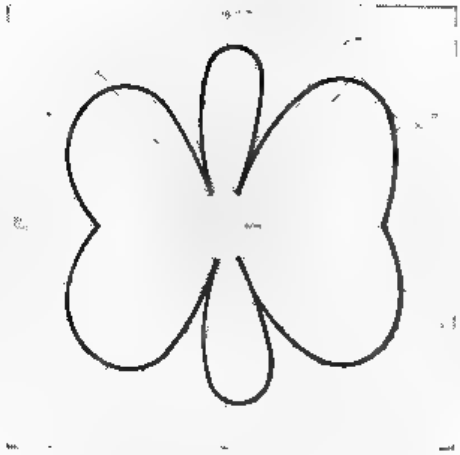


FIGURE 4: Directive Pattern for a Horizontal 1.5 Wave End Fed Wire.
A 21 m long wire would have this pattern on 10 MHz.

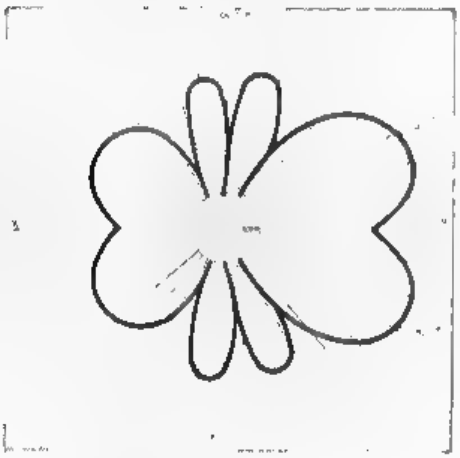


FIGURE 5: Directive Pattern for a Horizontal Two-Wave End Fed Wire.
A 21 m long wire would have this pattern on 20MHz.

radiation will be launched at very high angles which is satisfactory for local contacts but not of much help for terrestrial DX. A good DX antenna will radiate most of its signal at angles of less than 30 degrees to the horizon.

On 10 m and 15 m useful amounts of power will be at low DX angles.

If both ends are elevated then the antenna will usually need a 5 m or longer lead to reach the ATU. This will alter the feed resistance which may be undesirable. It will also add some vertical polarisation which may be

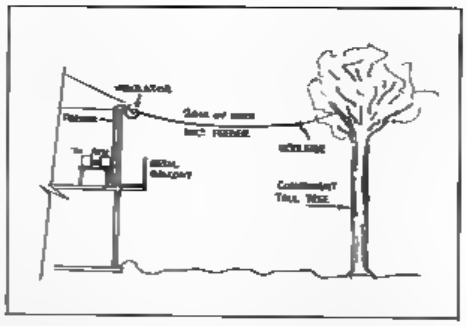


FIGURE 6: Possible Arrangement of a Multi-Band Wire Antenna for the Flat Dweller.

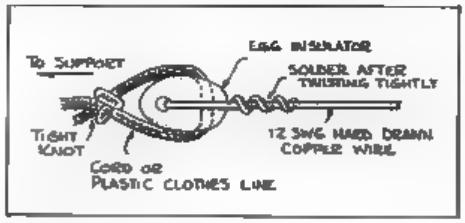


FIGURE 7: Method of Attaching Insulator.

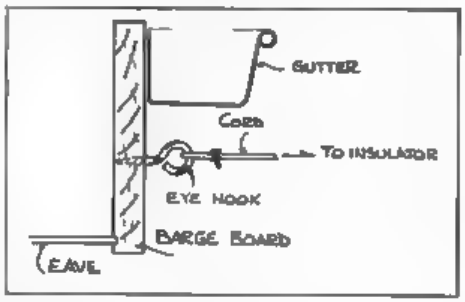


FIGURE 8: Method of Fastening to a Barge Board.

desirable as it may improve the DX performance on the lower frequencies.

If the transmitter can be elevated, such as would be the case if operating above the ground floor, then a minimal length of the antenna can be used as the lead-in and the total length kept to less than 21 m.

GROUNDING

As shown in Fig 1 the high input resistance allows operation with very poor RF grounding. A 1 m long ground stake would suffice except on 80 m where something more substantial is desirable. In situations where a ground stake or water pipe connection cannot be used a single wire counterpoise can be used. It can be bent to fit the space and can be as short as 5 m except on 80 m where it should be about 21 m long. The

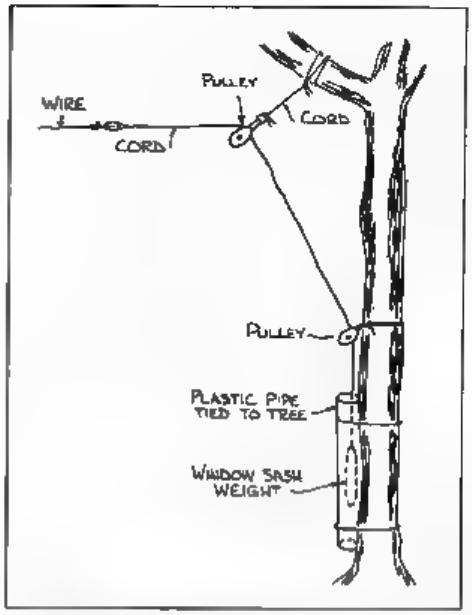


FIGURE 9: Arrangement for keeping Constant Tension on the Antenna. This allows the tree to sway in the wind without breaking the wire.

counterpoise should be treated like half a dipole and kept reasonably clear of conducting objects. If possible it should not bend back on itself except near the far end.

The advantage of this antenna on the higher frequencies is the ability to use minimal earthing, such as a metal balcony rail, without loss of efficiency.

WARC BANDS

The 20 m wire could be successfully operated on the 10.1, 18 or 24 MHz bands via the ATU. The feed impedance will be reactive and the resistive component will be lower so a more efficient ground would be required.

CONSTRUCTION

Any copper wire of reasonable gauge can be used. It can be bare or insulated thus twinflex or figure-of-8 240 V flexible cable can be used. An insulator is required at each end. The common small egg shaped type is adequate for novice power. Any convenient object may be used to support the wire, such as a tree or nearby building. A wooden mast would be even better, absorbing less power than a tree or building. If you intend to operate in open country then a pair of collapsible poles would be desirable.

Figs 6, 7, 8 and 9 illustrate some details of construction, in particular a method of overcoming the movement of a tree in the wind.

Reference: The ARRL Antenna Handbook

AR

INTERNATIONAL TRAVEL HOST EXCHANGE

In conjunction with the ARRL the Federal Office of the Institute will be maintaining a list of Australian amateurs who are interested in exchanging holidays and/or making travel arrangements with amateurs from other countries.

The Federal Office would like to hear from Australian amateurs who would be interested in meeting and in some circumstances accommodating overseas visiting amateurs. Those amateurs who notify this office of their willingness to participate in these arrangements will have their information distributed throughout all the world's societies that will be taking part in this scheme.

The second part of this scheme benefits Australian amateurs who wish to travel overseas – by contacting the Federal Office names and addresses of overseas amateurs taking part can be supplied, this will enable Australian amateurs travelling overseas to make arrangements to meet and possibly stay with amateurs. *(Naturally this will not happen overnight, when the listings are available a further notice will appear in AR).*

The information required by prospect members of this scheme is:-

NAME CALLSIGN ADDRESS ANY LANGUAGE SPOKEN

ABLE TO ACCOMMODATE VISITORS UNDER SOME CIRCUMSTANCES AND TYPE AND DURATION AVAILABLE.

AGE GROUP

PROFESSION OR TRADE

AR

COMPUTER PROGRAMMES

Unfortunately the computer programme on page 10 and 11 of September faded in some places during printing.

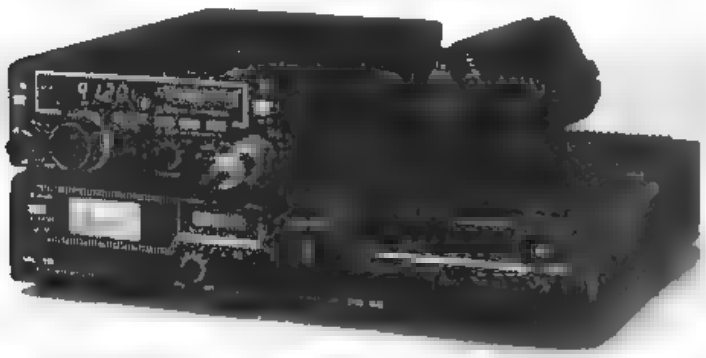
Copies of this programme may be obtained from the Federal Office of the Wireless Institute of Australia, PO Box 300, Caulfield South 3162.

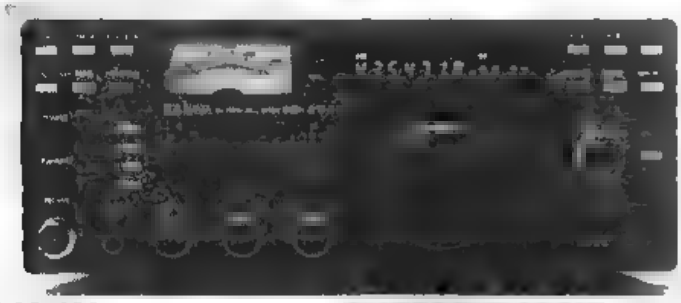
A note to prospective authors of computer programmes – It is preferable to print a computer programme direct in the magazine as it alleviates errors which may occur and henceforth render the programme inoperable. Therefore could you all please ensure your print out is in *extra dark type* please.

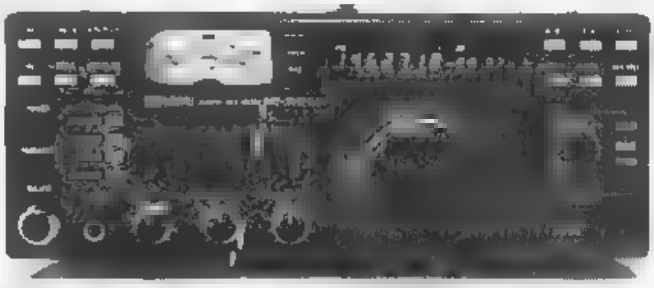
AR

ICOM - The World System

Now showing at Authorized ICOM Dealers throughout







1. IC-120
1.2 GHz mobile compact unit with 6 memory channels plus 2 VFO's, memory and frequency scanning, duplex facility even RIT, plus green LED readout 1 Watt output. Optional ML-12 power booster and PS-45 power supply units are shown.

2. ARRIVING SOON! IC-04A
The latest in hand-held transceiver technology 16 button keyboard controls frequency entry and control functions. Features also include priority, scanning of the 10 memories and programmable band scan. Frequency range between 430 and 439 995 MHz Wide range of accessories available, and built for years of hassle-free operations.

3. IC-02A
Direct entry, microprocessor controlled, a full featured 2 meter hand-held, other features include scanning, 10 memories, duplex offset storage in memory, LED readout and as shown, a wide range of compatible optional accessories are available.

4. IC-R71A
2MHz - 30MHz general coverage receiver with innovative keyboard frequency entry and (optional) infra-red remote control. 32 programmable memory channels, SSB/AM/RTTY/CW/FM, dual VFO's, scanning, selectable AGC and noise blanker all this means unmatched versatility and performance in its price range Computer compatible with optional EX 309 fitted.

For further details, see your nearest Authorised ICOM Dealer

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Stallard Communications, 27 White Ave, Lockleys (08) 352 3714

NORTHERN TERRITORY
Farnes Electronics, 34c Elder St, Alice Springs (089) 52 2967
Integrated Technical Services, 1 Carey St, Darwin (089) 81 5411

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V K Electronics, 214 Mount St, Burnie 31 7733
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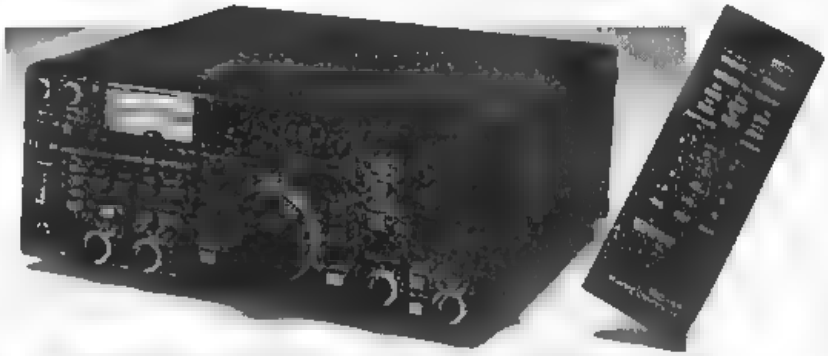

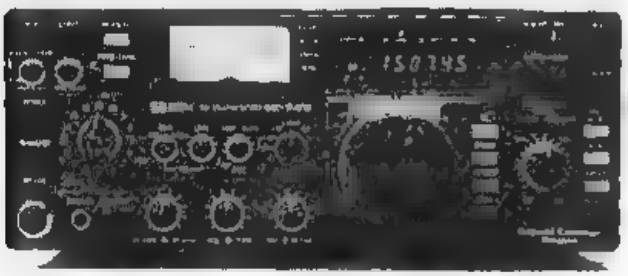

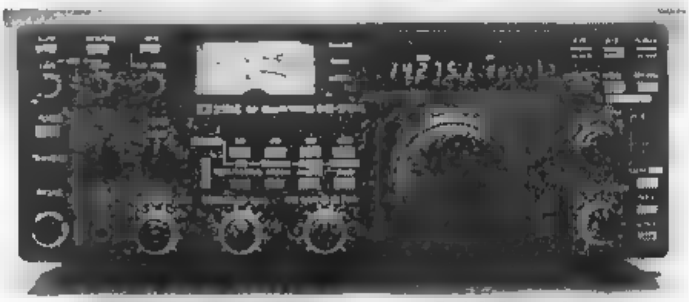

5. *NEW!* IC-471H
Deluxe 430 – 450 MHz base transceiver with phase lock loop for extreme accuracy, easy to read two colour display, memory scanning and programmable band scan, 75 Watt PEP transmitter output (adjustable) in a compact unit with all the reliability of every ICOM product. Options available include internal AC power supply PS 35.

6. *NEW!* IC-271H
With 100 Watt transmitter, a transceiver ideal for use with repeater or simplex. 32 full function tunable memories, PLL locked at 10Hz, flourescent display for high visibility, frequency scanning mode, duplex check switch, all-mode squelch, S-meter, lithium battery memory backup, accessory connector and microphone. 12 V DC operation, plus a wide range of optional accessories including internal AC power supply PS 35.

7. *OUR BEST SELLER!* IC-745
The "All in one" Amateur band transceiver and general coverage receiver with SSB, CW, RTTY, AM (receive) plus FM option, with optional internal power supply. Other features include IF Shift, passband tuning, notch filter, and other wanted features including 16 memories, scanning, dual VFO's and lithium battery memory backup. Wide range of optional accessories also available.

8. ICOM IC 751
Popular 100KHz – 30MHz receiver, with 32 tunable memories, programmable scanning, passband tuning, can be interfaced with a computer dual VFO's, full function metering, SSB and FM squelch, easy to read flourescent display. Internal optional power supply, lithium battery memory backup and a large range of optional accessories including optional voice synthesizer E310.

VICTORIA
Eastern Communications, 168 Elgar Rd, Box Hill South (03) 288 3407
GFS Electronics, 17 McKeon Rd, Mitcham (03) 873 3777
C.S.S. 600 Nicholson St, North Fitzroy (03) 481 2444
Codlin Communications, 84 Albert St, Moe (051) 27 4546
Wecam, 11 Malmesbury St, Wendouree (053) 39 2808
Ansonic Electronics, P.O. Box 2115, Port Fairy (055) 68 1434
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Communications Systems, 88 Guthrie St, Osborne Park (09) 445 1333
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Linear Electronics, 14 Trollwood Dve, Woodville 409 1272

NEW SOUTH WALES
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Macelec, 99 Kenny St, Wollongong (042) 29 1455
Amateur Electronic Imports, P.O. Box 160, Kogarah (02) 547 1667
Landlink Communications, Mullaley Rd, Gunnedah (067)
Rivercom, 9 Copeland St, Wagga Wagga (069) 21 2125
D.X. Engineering, 5 Jasmine St, Port Macquarie (065) 82 0175

Discover a new deal with ICOM Australia

ICOM

The World System

HOW'S DX

Ken McLachlan, VK3AH
Box 39, Mooroolbark, Vic 3138

Many well known call signs, that were prominent on twenty, fifteen and ten metres when the DX was there for the taking, are now appearing on eighty metres from time to time. It is unfortunate to note there are a considerable number of those with unlimited privileges who avoid the novice section of this band.

It is a pity, the wealth of knowledge covering a wide spectrum from construction techniques to operating procedures held by those that are too shy to venture into the novice segments is not shared, and encouragement given to those wishing to upgrade. The minority go to untold lengths to assist all comers, unfortunately the majority seem to have the attitude of *"I have made it. Why bother"* The personal satisfaction of seeing a SWL pass the exam or a fellow amateur gain an upgraded licence is a thrill I find very hard to put into words.

On a lighter note, which may bring a smile to a few readers, journalistic friends have advised me over the years that one, when writing a column, should provide something on all levels of the subject for the readers, including those looking for mistakes. This is my policy and I am sticking to it. *Can any reader think of a better "let out" for the occasional typographical, grammatical or unintentional omission from one that suffers from graphomania?*

US PHONE BANDS EXTENDED

As from the 1st September 1984, US amateurs may operate phone (A3 and F3), as well as SSTV and FAX (A4, A5, F4 and F5) emissions on the following frequencies

FREQUENCY	LICENCE CLASS
3.750 — 3.775 MHz	Amateur Extra.
3.775 — 3.850 MHz	Advanced and up.
3.850 — 4.000 MHz	General and up.
21.200 — 21.225 MHz	Amateur Extra.
21.225 — 21.300 MHz	Advanced and up.
21.300 — 21.450 MHz	General and up.
28.300 — 29.700 MHz	General and up.

The FCC will allow phone operation on 7 075 — 7 100 in Hawaii and other areas near Region 3 including KL7.

SPECIAL EVENT STATIONS

Two special event stations are active out of Czechoslovakia to commemorate the fortieth anniversary of the Slovak National Uprising. The stations are OK6SNP and OK7SNP and QSL's go to OK3KBB and OK3KPV respectively

WARC BANDS FROM VK5GZ

Lindsay VK5GZ, in a recent letter, comments he has communicated with thirteen VK stations on 24 MHz up until the end of July but recent DX activity has been nil. On 18 MHz, the pace has been brisk and Lindsay has worked VK, VK9Y, C21, DL, F, FO8, FR7, G, GM, GW, HB9, I2, LA, OE, OZ, T30, VU2. VP9, YU and ZS6 prefixes. A35 and DL2GG/YV5 have been heard also.

Lindsay runs a programmable CW CQ caller, with 100 watts output, as a manned beacon and in the three week period between the 8th and 29th June the caller was answered by I2AY, DL6NB, VP9C, F3NB, FR7BP, ZS6AVM, ZS6BCI and LU1EGX/MM (enroute between Singapore and Durban) and many VK's.

Lindsay will gladly supply details of the one memory unit he is using to anyone who is interested. I suggest a large SAE, accompanied by stamps to cover copying and postage to VK5GZ QTHR.

Thanks Lindsay for the information and the offer of the CQ caller details to interested users of the WARC bands.

PROJECT GOODWILL

Project Goodwill is administrated by the ARRL and co-ordinated by Nao N1CIX. Nao has sent three Project Goodwill transceiver kits to YI1BGD (the only operational station in Iraq) and five to the Society of Trinidad and Tobago to foster the hobby in these countries.

NEW YL OPERATOR

Remember the YL voice from Willis Island? (Refer How's DX September AR p34). Denise, through intensive study of the syllabus since her return from Willis Island and with the help of examination papers and Morse tapes obtained from the Federal Education Co-ordinator, Brenda VK3KT, has passed the DOC examinations.

DESECKED

This DXpedition under the calls of /KP5 is one that did not favour the VK's in any respect. Congratulations to those who made it for a new country, before the Coastguard warned them of approaching storms and advising them to leave the island earlier than anticipated. QSL's are via WP4ATF

LOGS NOT RECEIVED

A short note from John W4FRU, indicates he is having trouble receiving logs from Ian KX6PO. The last logs received were through to the 31st December last year. John contacted Ian in May this year and at that time a promise was made to forward them on. To date nothing has been received. John is going to return all cards if the logs are not received by next month.

John is QSL Manager for the following stations. *3X1Z, 5N0DOG, 5T5ZZ, A4XYS, FB8WJ, KX6PO, VK4NIC/3X, ZD7HH, ZD8HH, ZD9BV and ZD9YL.*

John mentions propagation to Henri has been very poor since early July, not allowing the transferring of logs. Henri, at that time, advised a vessel was due shortly and he would post the logs on it. Henri is due to leave Crozet in late November this year.

John's new mailing address is W4FRU, PO Box 5127, Suffolk, VA 23435 USA.

CLEANING UP!

The FCC have, of late, made a number of prosecutions regarding irregular amateur operations. World Radio reports *"On 19th March, David Saks, a licensed amateur, was indicted by a federal grand jury on the charges of using "obscene, indecent and profane language" on amateur radio. The charge carries a maximum penalty of two years in prison and a $10,000 fine."*

Ham Radio in June this year reports *"Operating after his licence was lifted brought a suspended sentence with a threat of prison to a Californian ex-amateur. The former amateur, who lost his licence for jamming WESCARS and other 40 metre operations, was sentenced to a 90 day suspended sentence and three years probation in the Federal District Court on 19th April. Under the terms of his probation, however, he can go to jail if he even talks from another amateur's station during the probation period, unless the FCC chooses to re-licence him"*

Many other instances are noted, including items such as, the FCC has ordered amateurs "to show cause why their Amateur Radio Licences should not be revoked", details of heavy fines and the voluntary surrendering of an amateur licence for a given time.

These are only a sample of the reports which have been noticed, from reading North American magazines of late.

CAMEL DRIVER'S RADIO CLUB

A strange sub-heading, but actually true, such a club did exist. It was formed in Afghanistan, where there was no licensing authority in the 1970's. At that time, there was no telecommunication office, monitor station and many foreigners were without communication except for those that had access to telecommunications from the telegraph office and airport.

Members of the CDRC, which included many of the commercial operators and several high ranking government officials, chose ITU designated prefixes for Afghanistan and then added their own alloted suffix. Should any member of the group receive "special" attention from the authorities for their amateur activities, all the other members would rally to assist and prevent any unfortunate ending up in an Afghani prison, a place to be avoided at any cost.

The club had a constitution, which placed its members ultimately under "un-official" governmental control and they were allowed to issue operating permits.

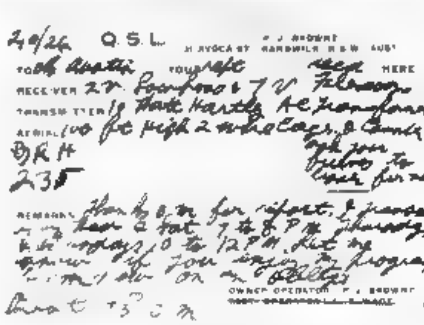
Eventually, the country gained its first monitoring station, the police became active and eventually closed down all amateur operations.

It was felt that the Club had served its members well for the purpose that it was intended and had provided a necessary service for many "amateurs" and non amateurs alike.

"Extracted and adapted from an article by VE7IG in Long Skip"

CARDS OF YESTERYEAR

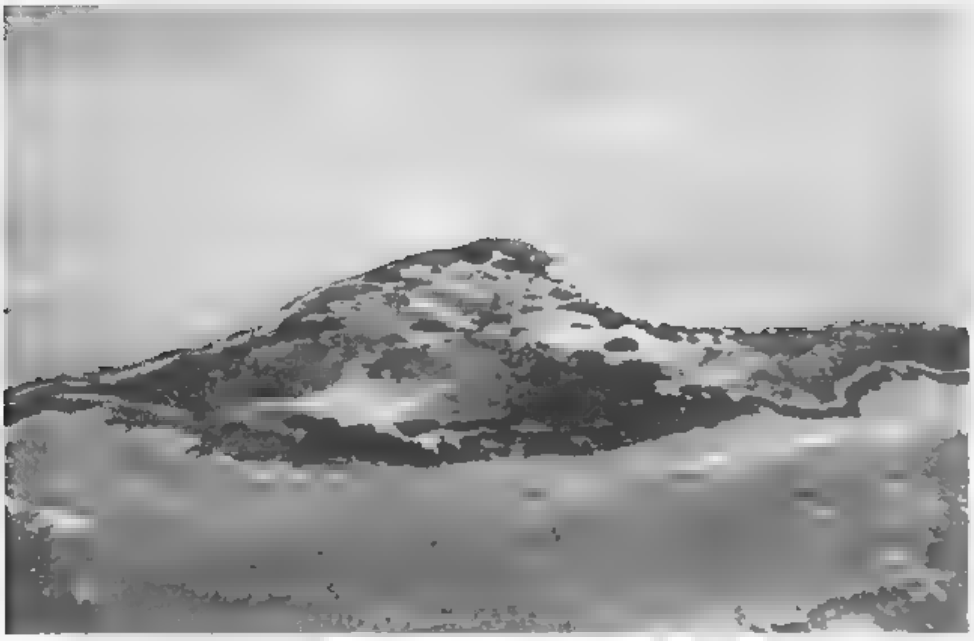
This month, three cards from the 1926 era are reproduced hereunder. From all reports received, the cards that have been reproduced in this column over the last few months have created a lot of interest amongst many members.



A GLIMPSE AT GLORIOSO ISLAND

The Glorioso Islands are a small group of islands, islets, rocks and sand bars located along a reef in the Indian Ocean just off the north eastern coast of the Malagasy Republic. The islands have been administered by the French since 1892.

The larger island, Grande Glorieuse or Big Glorioso, is the site of a weather station and airfield. Located at



Isle du Lys as seen from the air

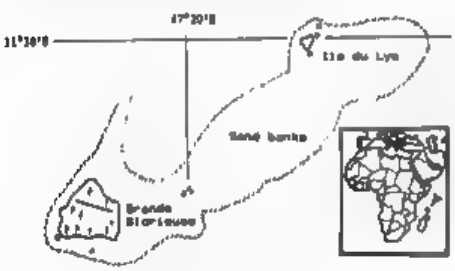
the southwest end of the reef, it is a low sandy island about 2300 by 1700 metres in size. During the mid 1920's, this island was the site of a large coconut plantation of some 6000 trees.

Isle du Lys, to the north east, is about 600 metres long and is inhabited by thousands of rats which may have arrived from a wrecked ship or with miners who once mined guano.

Currently the only inhabitants are the staff of the weather station but at times since 1862 the islands have been uninhabited.

It is not known when the next DXpedition will be heard from this area, though rumours indicate that it may not be long before a French orientated group operate FR0, but meanwhile it is climbing up the wanted list.

Adapted rom ORZ DX V 10 26 25/06/84.



Location of the Glorioso Islands

ALBANIA

The visit by OH operators was cancelled at the last moment. Mart OH2BH, is still hopeful that another date can be arranged for the visit and maybe possible operation from Albania.

MONACO

The mainly CW mode activity early last month by F6EYS, F6HIX and others from 3A can be QSLed via F6EYS.

ARRL DXCC HONOUR ROLL

June QST, listed the current list of amateurs that have obtained at least 306 of the current countries available. It was heartening to see a number of VK's included in the listings.

MIXED: *VK4QM 314/363, VK6HD 311/331, VK3YL 310/347* **PHONE:** *VK5MS 314/359, VK6RU 314/362, VK4QM 312/347 and VK6LK 307/324.*

With the chance of 3Y being operational for a short period next year, I am sure the above figures could change. Congratulations to all those on the ARRL DXCC Honour Roll.

DXCC ACCREDITATION CRITERIA

The following information has been adapted from June QST. Though lengthy, its content is of interest to all intending DXpeditioners and DXers alike and on reading, in my mind, makes common sense.

With the concurrence of the DX Advisory Committee, the ARRL Awards Committee has adopted the following Accreditation Criteria to be incorporated into the DXCC Rules and was approved on the 3rd April 1984.

DXCC Accreditation Criteria: *During the course of more than forty years of DXCC administration, standards have evolved in the acceptance of confirmations for DXCC credit. These criteria codify longstanding practice. The intent is to assure that DXCC credit is given only for contacts with operations that are conducted appropriately in two respects: (1) properly licensed; (2) physically present in the country to be credited. The following points should be of particular interest to DXpeditions. (1) The vast majority of operations are accredited routinely without any requirement for submission of documents. (2) In some instances, especially DXpeditions and in countries that have evidenced some reluctance to license amateur stations, or allow access, authenticating documents may be requested for review prior to accreditation. Such supporting documents could include the following: (a) Photocopy of licence or operating authorization. (b) For amateurs foreign to the country, photocopy of passport entry and exit stamps. (c) For offshore islands, a landing permit and/or signed statement of the transporting ship's captain showing all pertinent data (dates, etc). (d) For some locations where special permission is known to be required to gain access legally, evidence of this permission having been given may be required. The purpose of these accreditation requirements is to: (1) preserve the programme's continued integrity; and (2) ensure that the DXCC programme does not encourage amateurs "to bend the rule" in their enthusiasm, thus jeopardizing the future development of amateur radio. Every effort will be made to apply this criteria in a uniform manner in conformity with these objectives.*

LISTEN FOR SAO TOME

Craig WB7RFA hopes to activate this much wanted country towards the end of this month and early in November. DXers from all states trust the operation comes to fruition and propagation will favour VK.

TUNISIA

By all reports, the hobby is a **"NO NO"** at the moment but Angela 3V8AI (the first YL from this country?) has been active as well as 3V8AL and 3V8AM, who have both reportedly sent documentation to the ARRL DXCC Desk.

CARDS INTERCEPTED

Mansoor AP2MQ, notes cards with currency included do not normally reach him without being intercepted. He continues that 3 IRC's are the only way to prepay for postage from Pakistan.

Unfortunately this is a sad tale that can be attributed to a number of countries. As has been said many times in this and other DXing columns, it is advisable no mention is made on the envelopes to the hobby in any form, IRC's are placed within the return envelope and stamps are so heavily franked so they are adequately disfigured and therefore useless for bartering. It's a pity such measures have to be taken but apparently this has become a way of life. Of course half the above problems are alleviated with those lucky enough to have access to a franking machine.

SPRATLY

Chito DU1CK has had a lot written about him since his last expedition to the Spratly Islands. The latest report is that Chito put all his money (and IRCs???) into an election campaign which he lost. Could it be said, *QSL promises are like election prpmises???* No further comment!

ACTIVITY PLUS

The DXpedition to Taiwan, by the DX Family Foundation to commemorate their fifth anniversary, amassed 16,320 QSO's. BV0JA logged 13,545 contacts with 89 countries on the HF bands. This call handled 194 contacts with 19 countries through Oscar 10. BV0YL made history in being the first YL to be active from this country and again with a QSO through the satellite from BV soil.

BY PREFIX ALLOCATIONS

The authorities have issued blocks of call signs applicable to all the "provinces" in the Peoples Republic of China.

This will see more stations appearing from this much wanted country and it is my tip that SSB will be used in the near future by these very friendly people from selected stations.

SOUTH COOK ISLANDS

Bob ZL1BBZ, operated from this area between the 14th and 26th July. Bob used a TS430 fed into dipoles and suffered poor propagation. QSLs to 10 Collingwood Road, Waiuku, New Zealand.

PROPAGATION

Lee KH6BZF, predicts the 10th and 11th of this month should bring good propagation on the HF bands. Unfortunately Lee's predictions generally arrive too late for the "deadline" of this column.

BITS AND PIECES

R1O and RZ1OWA are active from Franz Josef Land. QSLs to UB5KW via Box 88. *** Svalvard Island operator JW1CY will return home for Christmas and JW5VAA will be signing from Hopen Island for the next nine months. *** Warick ZL8AFH's tour of duty has ended. *** American orientated activity expected from Taiwan this month. *** Pradhan A51PN has been heard around the twenty metre band again. *** Another Chinese station, BY5RA is active. *** At the end of March 1983, in excess of 550,000 amateurs were licenced in Japan. *** 4K1GAG appears to be genuine and QSL s are via UQ2OC. *** PY0 Trindade expected to be activated in December for a short period. *** I2YDX who has signed 600DX intends to be active from Haiti during December. *** Andy VK9ZA has been inactive because of beam problems caused by a hefty "blow" that hit the island. *** Prefix hunters had a 'ball' with XO3, XK3 and CJ8 emanating from Canada for "special events" in the last couple of months. *** Operation from the Andaman Islands' applications have been refused. *** Rumours are that a VK orientated DXpedition will be made to Mellish Reef in late October to early November, covering the CQ WW Phone Contest. *** RJ6R active from Oblast 042. QSLs to UJ8JJ via Box 88. *** Father Moran 9N1MM, is due back on the air in early December from his QTH at the Godavari School, after his extended holiday in the USA.

COPY CLOSING DATE

The copy closing date for these notes are two days

prior to the closing dates advertised on page 1 of AR each month.

THANKS

Thanks are extended to such magazines as OZ, OLD MAN, HAM RADIO, WORLD RADIO, 73, QST, cqDL, VERON, JARL NEWS, KARL MAGAZINE and weekly, bi weekly and monthly newsletters including DX NEWS, QRZ DX, RSGB NEWS BULLETIN, ARRL NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST, THE DX FAMILY NEWSLETTER and KH6BZF REPORTS. These publications have provided the writer with valuable information in correlating these notes. Amongst Australian amateurs who have contributed are VK's 2KZ, PS, EBX, 3BY, FR, YJ, YL, 5GZ, 6FS, NE and 9ZA. Overseas amateurs include G3NBC, I8SAT K6UD, W4FRU, ZL1AMN and ZS5DC. Sincere thanks to one and all. Good DXing to all on whatever band may open up for a contact.

QSL DIRECT TO:

4S7PVR	PO Box 507, Colombo, Sri Lanka.
5H3LB	PO Box 4094, Dar es Salaam, Tanzania.
5H3TM	PO Box 1426, Mbeya, Tanzania.
6V1A	PO Box 971 Dakar, Senegal.
9L1SL	PO Box 10, Freetown, Sierra Leone.
A4XJP	PO Box 230, Misirah Isle, Oman.
A71AD	PO Box 4747, Doha, Qatar
AH2AZ	PO Box 445, Agana, Guam 96910 USA.
AP2P	PO Box 999, Rawalpindi, Pakistan.
BY1QH	PO Box 2654, Beijing, Peoples Republic of China.
BY5RA	Fuzhou China Sports Association, PO Box 730, Fuzhou, Peoples Republic of China.
CE0ZAI	PO Box 1, Isla de Pascua, Chile.
CO6RCB	PO Box 785. Santa Clara, Cuba.
EL2BB	PO Box 463, Monrovia, Liberia.
EL2EM	PO Box 483, Monrovia, Liberia.
ET3PS	PO Box 8126, Addis Ababa, Ethiopia.
FH8CB	PO Box 50, 97610, Mayotte, France.
FW8AF	PO Box 92, Wallis Island.
HK0HBT	PO Box 396, San Andres Island.
J79CB	PO Box 389, Rousseau, Dominica.
JY5AZ	PO Box 5100, Amman, Jordan.
KG4DX	PO Box 43399, Jacksonville, FL 32203 USA.
LA6CW/OY	PO Box 66, N-5014 Bergen University, Bergen, Norway
OY9R	PO Box 88, Torshavn 3800, Faroe Islands.
PZ1AP	PO Box 566, Paramaribo, Surinam.
S79WHW*	PO Box 491, Seychelles.
SV0BM	Mark Haskell, RR 3, Box 92, San Angelo TX 76904.
SV0BN	Mark Haskell, RR 3, Box 92, San Angelo TX 76904.
SV5CX	PO Box 157, Rhodes, Greece.
V85HI3	PO Box 222, BSB, Brunei.
VK9LW	PO Box 146, Cambridge, England.
W4FRU	PO Box 5127, Suffolk, VA 23435 USA.
XT2BR	PO Box 116, Ouagadougou, Upper Volta.

** Note: Apparently requires US$2 included! ...???*

QSL MANAGERS

*3A0AA: IØMWI, 3D2DX: VE5RA, 3D6AJ: WB3CQN, 3D6AK: G3WPF, 3D6ER: W5RBO, 3V8AI: IW3RZY, 3X0Z: W4FRU, 3X4EX: N4CID, 4N3E: YU3HAM, 4N7W: YU7JDE, 5N0DOG: W4FRU, 5T5ZZ: W4FRU, 5W1EJ: WØWP, 5Z4WD: DF6BV, 9M2DC: G4RZO, 9X5AL: SM5IB, 9X5WP: WB6VKD, A22DP: W7GVC, A22ME: AK1E, A35SA: JM1MGP, A4XJV: WD6RTK, A4XYS: W4FRU, A92DQ: K2UL, C30BAN: F6BII, C30LBF: DL2YAI, CE0FCM: WB6WOD, CE0ZIA: KA1ILA, CT0BI: CT4BW, DJ4UXZ**: *DJ5IO*, IT9KFQ: *IT9ZGY*, ITB4VDQ: *IT9TQH*, *J73AB: KF4UP*, *J88AQ: W2MXG*, JT1AO: *W7PHO*, *JW1UW: LA1UW*, *JW6BAA: LA7JO*, *JW6BDA: LA5HM*, *JY3ZH: DJ6ZB*, *JY8AQ: W6ORD*, K1RH/FP: *K1RH*, K6PO: *W4FRU*, KA1CI/FP: *K1RH*, *OD5OA: F0DDA*, *OX3SG: LA5NM*, *PJ4CR: WB2LCH*, *T32AB: N7YL*, *TR8AHO: DK1PO*, TT8RP: *F6KGU*, UK1PGO: *UA1OSM*, *VK0AG: VK3BER*, WA1CCH/FP: *K1RH*, *ZD7HH: W4FRU*, *ZD8HH: W4FRU*, *ZD9BV: W4FRU*, *ZD9YL: W4FRU*, ZL7BKM: *ZL2HE*, *ZL8AFH: ZL3AFH.*

**Note: May not be acceptable for DXCC.*

INTERESTING QSO HELD ON THE EAST COAST

21 MHz

A35MO, BV0AA, EC8AEU, UA0ZCQ, XE1MR,7P8CL.

14 MHz

4K1D, 9M2DF, EA3JE, EI6IF, FW0BT, G3NBC, GM3FW, GM4ORL, GW4EDF, HA3MA*, HG3RST/KP5, HV1SJ, I1DFS/IA5, IT9AUT*, JY5ZH, KB4OG, KI8AO, KI8AO*, KL7T*, LA0CX*, SP9PDF*, SV2RE, UO1GXX*, WA2NSR, W84OG, Z23VO*, ZS6ACY

7 MHz

BV0YL, CO2HT*, CO2PR, CT2ARA, DK0WL*, EA7AYD, EA9IE, FW0BT, G3HTA, H44IA, HH7PV, HK4ARQ, JR7FTV,, KB4OG, KE23PO*, KE23PO*, KL7Y*, KI6DS*, NP4AT, OA4ES, VE7PR*, VK9LW*, VK9LX*, VK9ZA, W1JF*, W23MD*, W23OG*, XO3IY*, YU1MR, YV5AE, YV5AE*, YV5ANE*

3.5MHz

FW0BT

1.8 MHz

VK6HD*, VK6HO*, VK7RY*, W0KEA*, W6JSF*, W7TJ*

**Denotes CW.*

INTERESTING QSLS RECEIVED

3X4EX 4K1D, 4U1VIC, CN8MK, CR9T CT3BM, DK9VC/DU1, EL2AM, FO8EW, HA2KMR, HA3RB, HA6NF, HH5CB, HK3NBB, HL1APR*, HL2AKB, HP1XJN, K0CS/KH8, LX0WCY* OH0X2, OX3JF, OZ8RH, TI2J, TO8DZU, UO2GLQ, YB0ZCE, YB8ARM, ZB2EO

denotes YL* **AR

ATTENTION TO SCHOOL RADIO CLUBS

KH6NF
McKinley High School
Amateur Radio Club

The McKinley High School Radio Club, with their advisor Emil Bruner KH6HHM, are seeking contacts with school radio clubs throughout Australia.

They are on 21.000 MHz at 21.30 UTC Mondays, Wednesdays and Thursdays and from 0030 to 0100 UTC Tuesdays and Thursdays they operate on 28.520, 21.420 and 14.320 MHz.

QSL and information address is c/– Emil at 45626 Mahinui Road, Kaneohe, HI, 96744. **AR**

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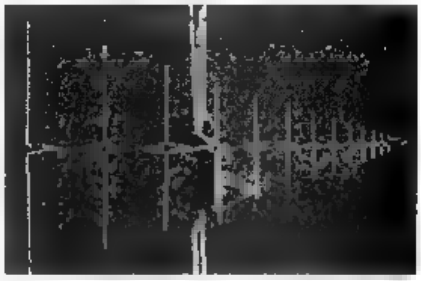

LOG-SP 13 ELEMENT LOG PERIODIC, 65-520 MHz

The LOG-SP is a special performance log periodic type beam antenna, which is designed to cover the frequency range 65 to 520 Megahertz. It has 13 elements and a boom length of 3 07 metres. Gain of the LOG-SP is 11.5 dBi while maximum power rating is 200 watts. CW.

$177 + $12 P&P

LOG-S 9 ELEMENT LOG PERIODIC, 100-520 MHz

The LOG-S is a smaller log periodic beam antenna than the LOG-SP. It is designed to provide frequency coverage from 100 to 520 MHz with a gain of 9.5 dBi The boom length of the LOG-S is 1.02 metres. This antenna lends itself well to any application from the airband upwards to 520 MHz where gain and directional characteristics are a requirement.

$125 + $12 P&P

GDX-1 16 ELEMENT DISCONE, 80-480 MHz

The GDX-1 is an omnidirectional discone covering 80 to 480 MHz. It has a gain of 6 dBi with a transmit power rating of 200 watts. Height of the GDX-1 is 1 metre. It may be used for receive only applications over a frequency range of 65 to 520 MHz.

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SCAN-X 6 ELEMENT DISCONE, 65-520 MHz

The Scan-X discone is designed especially for receive only applications and is ideally suited to programmable scanning receivers.

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MODEL MJF-1224 RTTY/CW COMPUTER INTERFACE

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- Copies on both mark and space tones.
- Connects between transceiver and VIC-20, Apple, TRS-80C, Atari, TI-99, Commodore 64 and most other personal microcomputers providing appropriate software is available or use the CP-100 intelligent communications interface.
- Uses short 8 Pole active filter for 170Hz shift and CW.
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- A reverse/normal switch helps eliminate re-tuning
- An automatic noise limiter helps suppress static crashes for better copy.

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1 Quinns Road, Forreston, SA 5233

All times are Universal Co-ordinated Time and indicated as UTC.

AMATEUR BANDS BEACONS

Freq	Call sign	Location
50.005	H44HIR	Honiara
50.008	JA2IGY	Mie
50.020	GB3SIX	Anglesey
50.109	JD1YAA	Japan
50.945	ZS1SIX	South Africa
51.020	ZL1UHF	Mount Climie
52.033	P29SIX	New Guinea
52.100	ZK2SIX	Niue (1)
52.150	VK0CK	Macquarie Island
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52.300	VK6RTV	Perth (VK6RPH) (2)
52.310	ZL3MHF	Hornby
52.320	VK6RTT	Carnarvon
52.325	VK2RHV	Newcastle
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52.450	VK5VF	Mount Lofty (3)
52.490	ZL2SIX	Blenheim
52.510	ZL2MHF	Upper Hutt
144.019	VK6RBS	Busselton
144.420	VK2RSY	Sydney
144.465	VK6RTW	Albany
144.480	VK8VF	Darwin
144.550	VK5RSE	Mount Gambier
144.600	VK6RTT	Carnarvon
144.800	VK5VF	Mount Lofty (3)
145.000	VK6RTV	Perth
147.400	VK2RCW	Sydney
432.057	VK6RBS	Busselton
432.410	VK6RTT	Carnarvon
432.420	VK2RSY	Sydney
432.425	VK3RMB	Ballarat
432.440	VK4RBB	Brisbane
1296.171	VK6RBS	Busselton

(1) ZK2SIX on 52.100 has been heard in Japan a number of times so is now listed.

(2) A beacon apparently signing VK6RPH on 52.300 is being heard in Japan, and being on the former frequency of VK6RTV it is assumed to be the same beacon with a new call sign. No advice has been received here so far.

(3) The South Australian six and two metre beacons are now back on the air thanks largely to Mark VK5AVO. The six metre beacon is on the WIA band plan frequency of 52.450 but the two metre beacon is presently on its old frequency of 144.800. Whether or not it is possible to change to the band plan frequency would need to be determined after future testing.

SIX METRES

On the local six metre scene activity has been very quiet. There have been the usual odd Es contact to VK2 and VK4 but really nothing to rave about.

In Japan, according to their "CQ ham radio" magazine there has been quite a degree of activity. The last report I gave you two months ago covered the period to the end of February. In March the Japanese had contacts with YC1CHG, YB1BZ, YB1CS, FK8EM, FK8EB, FK8AX, FK0AQ, ZK2RS, P29ZFD, P29QA, JD1BBE, DU1GF, VS6XLG, DU1RGM, P29ZFS, YC0CXN, KH6IAA, H44PT, YJ8RG. VS6GW.

April saw contacts with KH6IAA, T32AB, FK8EB, P29ZFS, YJ8RG, ZK2RS, FK8EM, FK8AX, ZL8AFH, ZL7OY, P29ZFD, FK1SB, CE3OK, KH6IJ, DU1RTA, P29QA, VS6XMT, VS6XMQ, ZK1RS, JD1BBE, FK8CE, JD1AMA, KC6IN, FK8EP, DU1GAB, HL2ASH, HL1AHO, VS6XNF, VK9ZW, HL2AAW, HL2AAV, HL1AID, HL1PO and HL3ARA.

Many of the stations listed in the above two months were worked on several occasions. In addition stations were worked in VK1, 2, 3, 4, 5, 6, 7, 8, 9, ZL1, 2, 3. The elusive ZL4 seems to have escaped them! It is interesting to note that no ZL's seemed to have been worked after 18th April. Contacts to VK and ZL must have run into many hundreds during the period. Beacons heard included VK8VF, VK4RTL, ZL1UHF, VK6RPH, JD1YAA, H44HIR, VK2RSY, VS6SIX, ZK2SIX, VK0CK, ZL2VHM, VK9ZW, and VK6RTT. The most heard beacons were VK8VF and VK4RTL, with ZL1UHF and H44HIR next in line. The first two were heard on an almost daily basis whilst the latter two, several times a week.

All this indicates there are quite a lot of active stations throughout the Pacific and Asian area on six metres, just waiting to be worked when conditions are right. Those in prime positions in the north and the eastern coasts of Australia will always have the best opportunities, but there will always be some pickings for the observant station, wherever he might live.

Also from "CQ ham radio" for July 1984 is a chart showing the solar flux and smoothed sunspot numbers from May 1983 to May 1984. The smoothed sunspot numbers were May 1983 100.2, June 90.6, July 82.1, August 71.9, September 50.9, October 55.2, November 33.2, December 33.4, January 1984 57.6, February 84.5, March 74.0, April 68.6 and May 85.0. The highest peaks in the solar flux occured in June 1983 with 170, end of July 150, mid October 140, end of January 1984 180, end of February 170, end of March 145, end of April 185. One could wonder if in fact the low spot between the cycles was reached during November and December 1983 when the SSN were 33.2 and 33.4 respectively. Nevertheless it was around this time many VK stations were worked, probably with enhancement from the VK Es season.

QSL ROUTE

ZL8AFH: via ZL3AFH W! Latham, 166 McKenzie Ave, Opawa, Christchurch 2, NZ.

ZL7OY via VK3DWJ W Johnson, Post Office Skipton, Victoria 3361

ZK2RS. via JA2DDN. FK8CE via K2ROR. JD1YAA via JA1WU or JARL.

ZK1RS via ZK2RS R Sutton, PO Box 37, Alofi, Niue Island.

FK8AX. PO Box 224, Noumea, New Caledonia.

VS6 stations: via Harts, PO Box 541, Hong Kong.

VK9ZW via VK6YL Mrs G Weaver, 23 Corbel St, Shelley, WA 6155.

VK0CK. via VK5LP E C Jamieson, 1 Quinns Road, Forreston, SA 5233.

VK5LP is prepared to handle HF QSL's on the same basis as VHF with VK0CK ie *a self addressed stamped standard envelope for return of card is all that is required. Your contacts can be quickly verified as a weekly sked is kept with VK0CK on 20 metres.*

NEW TWO METRE PRE-AMP

David VK5AMK has passed on to me some details of a new 2 metre pre-amp which has been produced by the Equipment Supplies Committee of the VK5 Division of the WIA, with design work being done by Neil VK5ZJA assisted by Craig VK5ZAW.

The design centres around the BF981 MosFET with a noise figure of 0.6dB and a gain of 26dB, with an optional suggested 6dB attentuator on the PCB. Through loss about 0.2dB with an SWR of 1.05. DC current with relays 100mA, and a maximum power through rating of 100 watts. Coax relays are recommended for power levels in excess of 100 watts. Relay switching is included to allow masthead operation.

The kit will be complete with a pre-drilled PCB, the complete unit is 65mm x 50mm, and the PCB can be cut in half if relays are not needed. I note there is a sensible price structure of about $25, which may vary slightly according to final cost of the PCB. Post free to members of the SA and NT Divisions, others add $2.50. Any proceeds will go to the SA Division of the WIA, and an article featuring the preamp is to appear in the October VK5 Journal. Several have already been built.

Sounds like a good kit and if you have never observed the effect of a good pre-amp then you could be in for a surprise, particularly if you use it as a masthead amplifier. The VK5LP establishment has had such a pre-amp right up at the two stacked 13 elements for a number of years and quite a few contacts have only been made because such an amplifier existed. There are a few worthwhile things to know if you go ahead with a masthead installation, so if the kit does sell then I will consider penning a paragraph or so regarding installation and operation of such amplifiers at the appropriate time.

Whilst the information does not say so, I would expect the kits to be available from the WIA, SA Division, Box 1234, Adelaide SA 5001.

THE ANTARCTIC

Geoff Campbell VK2ZQC has written to advise that Don Richards VK2BXM will be skipper and radio operator on the motor sailer "Dick Smith Explorer" a vessel owned and operated by the Oceanic Research Foundation Ltd. which will leave Hobart in December for the Antarctic. Don will be carrying out scientific experiments on auroral scatter on the two metre band from an area near Dumont Durville which is near the South Geomagnetic Pole. Any further information may be obtained by contacting Don Richards VK2BXM or Geoff Campbell VK2ZQC, QTHR.

Considering the time of the year, December, it would seem appropriate for the party to take 6 metre equipment with them as well, with the distinct possibility of contacts being made on that band back to Australia and New Zealand at least. I would hope this has been considered and only abandoned if there are real reasons for so doing!

JOTTINGS FROM WOOMERA

Now that's a place we don't often hear from or about. However, Neil Carter VK5ZEE has written to let us know what has been happening in that section of the far north. The letter is dated 30th July.

Neil says there have been no contacts whatever on six metres for the past four months! There has been reasonable activity on two metres working VK5KUG in Port Augusta (200km) and quite often hearing some of the boys in Adelaide, but unable to break in due to them not leaving any pauses between overs? *(Shame chaps!)*

During week to 30/7 worked Ron VK5ZVA at Whyalla twice 5x8. Worked Bronte VK5KEG in Adelaide at 0100 on 29/7 at R4S0 after waiting one hour for signals to peak above the noise. He thanks VK5ZVA for sitting on the side and keeping them company. At 1052 on 29/7 Neil worked VK5ZVA and then tried to work VK5ZTS in Adelaide with no luck. (Perhaps you should try the new pre-amp!) Later VK5CI in Port Pirie came up but signals were not good enough to establish contact.

Neil writes: *"Been active on OSCAR 10 and have worked 25 countries for 56 contacts. Seems the only time I hear Bob VK5ZRO is on the satellite. Having some problems since I blew up my Kenwood 45 watt linear a couple of weeks ago. Haven't got a circuit for it, can anybody help with a copy of one please?*

"On the building scene I have commenced work on a 400 watt two metre linear and a 150 watt 70cm linear, both are awaiting sockets and chimneys. Have built two 1296 MHz 34 element yagis and awaiting arrival of 1269 transverter and 1296 transverter at the moment. In the same package there will be a 250 watt 1240-1300 MHz water cooled linear! Hopefully the boys will then look for me on these bands.

"Ron VK5ZVA has now got ATV and will be appearing on repeater VK5RCN as soon as he gets his antennas up. Hopefully with my increased power I should be able to get into that way with ATV as well. Have now got RTTY but haven't built the computer interface yet. Still got the three metre dish in the backyard and once I get 23cm equipment can see a concerted effort going into getting the E1 and Az rotators built.

"There appears to be a far north net going at the

moment with most people coming up between 1000 and 1030 nightly, with Alan VK5KUG Port Augusta, Ron VK5ZVA Whyalla, and VK5ZTS and VK5KEG in Adelaide being regulars on 144.100. Maybe a few more would like to join us. Incidentally Eric, you are the only VK5 I have worked on six metres!"

Thanks for writing Neil, hope all your efforts to improve your potential on the various bands pays off with more contacts. Maybe I should give you another six metre contact sometime!

A FAIR SIZE ANTENNA SYSTEM

From August 1984 QST and "The World above 50 MHz" is a report of a trek made by Jim W6JKV and Rob WB6SHD to Anguilla as VP2EME and VP2ESE respectively. Jim says he made some 300 tropo and Es contacts, and that VP2ESE (operated by Rob) had quite a few QSO's as well.

The secret weapon this time was an array consisting of two 50 feet-long, 11 element, six metre yagis designed by K6MYC. The two monsters were separated by 24 feet on a horizontal cross member with antennas orientated vertically. This arrangement made them much easier to mount than if they had been vertically stacked and mounted for horizontal polarization. Despite being cross polarized with virtually every 6 metre station, Jim says that on Es the big antenna was almost always considerably better that the single seven element KLM they also had in operation.

As effective as the big beam was for Es, the real story was the 6 metre moonbounce tests the two conducted with K6MYC and K6HCP. Using the setting moon both California stations were able to hear them, and vice versa, during every schedule. Obviously, Jim expressed great pride in what had been done and plans to cart at least one of the 50 footers to Greenland later for more tests.

Also in "QST" is a suggestion from NU6S that the DX calling frequency be moved from 50.110 to 150.120 because of the many carriers often found just above 110, apparently caused by TV games, computers and the like. He points out that at times the carriers are quite strong and can make copying a weak DX station difficult. The proposed frequency would still be compatible with the concept of leaving the first 25 kHz above 50.100 free for attempting DX contacts. DX stations please take note.

FILL IN THE SQUARES

An article by Wally VK6KZ in the "WA VHF Group Bulletin" mentions the increasing usage of the "Maidenhead" system of locator squares, even in Europe where they have had an established system for some years. The United States seems to be aiming to make use of the system in a greater way since they adopted it recently.

Wally points out that areas like Perth are divided into no less than four squares and says operators in that city will need to be very sure of their latitude and longitude to establish their correct position. He also asks for feedback from their VHF Group members as to whether they want competitions based on the use of locator squares. It will be interesting to see what the response is to that suggestion!

1296 MHz

Bob VK5ZRO continues to make tests on 1296 MHz and has currently been using RTTY on the band with 170Hz shift and contacts have been maintained with Syd VK5ME with signal reports 599 both ways.

In addition Bob has been experimenting with 1296 MHz mobile and for that purpose has constructed an Alford Slot Antenna for use on his car and has been having mobile contacts with VK5ME at distances up to 50km and using 1 watt each way, and signals varying from S1 to S9 depending on the location and terrain! What next?!

Bob is also waiting for Don VK5ZRG at Whyalla to get his 1296 MHz antenna system set up so as to see how the path can be maintained or achieved over the 210km involved.

RANDOM JOTTINGS

World Radio Amateur Day is to be held on 18th April 1985 and will be the Diamond Jubilee of the IARU. There should be more on this as the time approaches.

The RSGB VHF Conference held on 24th March 1984 resulted in an attendance of more than 2500 – this being the actual registration numbers! Would be interesting to see how the Mount Gambier people would [illegible]

The New Zealand VHF Field Day Contest takes place over the weekend of 1st and 2nd December. Starts on 1/12 at 0630 UTC.

Did you know the highest grade of JA licence has no upper power limit and this may be negotiated with the licensing authorities? One amateur is reported to be running 13kW, legally!

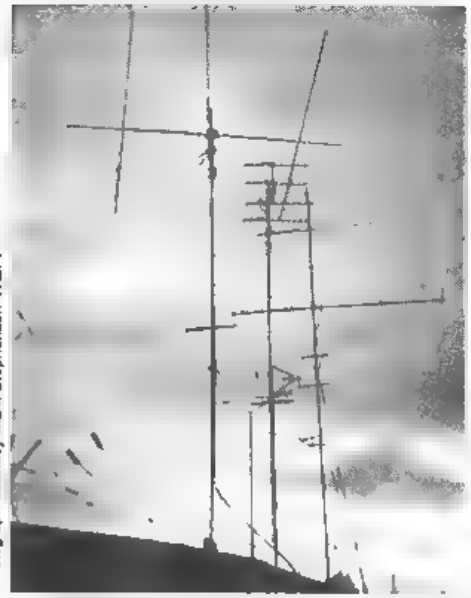
OK1AIY in Czechoslovakia builds all his equipment and currently runs 500 watts on 144 and 432 MHz, 60 watts on 23cm and 80 watts on 13cm. On 3cm he uses a varactor multiplier and one dish metre. Best DX on 23cm is 1350km, 13cm 1028km.

Lyle VK2ALU (QTHR) needs some SMA plugs (male) for either RG56 or RG214 coaxial cable, for use with the VK2AMW EME project. If you are able to help please contact Lyle as soon as possible.

CLOSING

Thought for the month: *"The first thing you learn when you buy a new house is that you don't live in the house. You sleep in the house. You live in the hardware shop."* 73. The Voice in the Hills.

AD



Photograph courtesy Mark Stephenson VK3PI

Bob VK5ZRO is renowned for his work on amateur TV and satellites, and his compliment of VHF and UHF antennae assure flexibility on whatever band he chooses. Luckily next door neighbour Steve VK5PO operates HF, otherwise one could imagine a "Gentleman s Agreement" being tested severely.

ALARA

Australian Ladies Amateur Radio Association

Margaret Loft, VK3DML
28 Lawrence Street Castlemaine, Vic 3450

By the time you read this our Get-together at Mildura will be over and the next major event will be our fourth contest to be held on Saturday 10 November from 0001 to 2359 UTC. Full details appear in the contest column of this issue of AR.

A full list of ALARA members will appear in next month's AR to coincide with the contest. We do hope all will join in this year, in particular the OM's.

MRS McKENZIE

The following is from the 3rd April 1931 issue of Wireless Weekly.

Mrs F V McKenzie, formerly Miss F V Wallace, was the first woman in Australia to take out a transmitting [illegible]

"My first licence was taken out in 1921, and the amateur operators certificate was gained by exam early in 1925 — call sign 2GA. I found the code very easy to learn as I had so many chances of practise with many young boys and men, who used to spend their spare time in my shop in the Royal Arcade, Sydney, learning and practising with me.

"The technicalities were not very difficult either as it is a short step from science and electrical engineering to radio (two years science at Sydney University and the Technical College Diploma in Elec Eng).

"I still spend much time reading to keep pace with all the developments, many of which are so well emphasised by Wireless Weekly.

"I have not made many friends over the air with the notable exception of friend-husband who used to be 2RJ, as I rarely transmit in the ordinary way. Have a pronounced kink for television work and devote most of my spare time in experimenting that branch of the science. Have a deep rooted conviction that chemistry is going to provide the solution and am working along those lines. I think that radio is a splendid past-time. I have made many valued friendships through radio and never tire of talking or writing about it or listening to it and I never expect to. It is a hobby of which one never tires, and if those who listened in knew more about the wonders of radio as a science, they would be far more appreciative and less critical of the programmes. To me the simplest broadcast is of absorbing interest — the comparison between the reproduction of the various instruments, the thrill of concentrating on, say, the bass viola or tuba and separating its notes and the differences in all the voices, gives interest to any item.

"I do not know of any other lady transmitters beyond those mentioned but do not be surprised if their number is added to considerably in the near future as I am establishing a Women's Radio College. Already several very promising pupils who mean to delve as deeply as possible into the technical side."

Mrs Mac as she was affectionately known by all the service men and women she taught Morse code to during the Second World War, certainly gave the YL operators of today a marvellous start. Along with the four other YL s licenced in 1931, it must have been a remarkable achievement to enter, what up till that time had been a male oriented hobby and business.

Certainly we can feel proud to be following in the footsteps of this small group of pioneer girls.

CHANGE OF CALLSIGNS

Meg VK5AOV formerly VK5NOE
Joan KD7YB formerly N7DGP

Congratulations to you both and to all who were successful in the August exams and good luck to those attending the November exams.

INTERESTING QSO

One contact I had recently was to talk to Margaret VK3MV, using the callsign VK3RAN, aboard the HMAS Castlemaine, thanks to Bernie VK5ABG for writing to me and setting up the contact. Probably not something that would happen very often, Margaret at Castlemaine talking to Margaret on the Castlemaine.

Until next month when I hope to tell you all about our trip to Mildura and also hope to talk to you on the [illegible]

73/33/88 to one and all.

Margaret VK3DML

AD

OPEN LETTER
TO
RADIO CLUB PROGRAM ORGANISERS
FROM THE WIA
FEDERAL VIDEOTAPE CO-ORDINATOR

c/o 37 Second Avenue, Sefton Park,
South Australia, 5083

AT LAST, ALL TITLES IN THE WIA VIDEO CASSETTE LIBRARY ARE AVAILABLE IN THE BETA VIDEO FORMAT AS WELL AS IN VHS

So now every Radio Club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library You'll find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for its regular meetings.

It's inexpensive and it's easy Here's how it works . . .

Except for those titles for which the WIA does NOT hold a copyright licence, all you have to do is

Supply me with a video cassette of an "acceptable format"

Enclose another STAMPED, RETURN-ADDRESSED Padded mailbag and the programme is free for you to use in support of amateur radio in your area including copying and transmission over the air if you wish.

Those programmes which are copyright are available only ON LOAN. To obtain any of them send with your request . . .

Information about your preferred VCR format.

A statement signed by a Responsible Officer of your Club that "I undertake that while (Programme Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing."

A STAMPED, ADDRESSED padded mailbag suitable for cassettes of your preferred format.

The present "acceptable formats" are as follows .

VHS	(Size 200 x 110 x 30mm, Mass 350g, 3Hr max)
BETA	(Size 160 x 100 x 30mm, Mass 300g, 3Hr max)
Umatic	(Size 260 x 180 x 40mm, Mass 835g, 1Hr max)
Philips N1500	(Size 160 x 140 x 50mm, Mass 625g, 1Hr max)

Of these VHS and BETA are preferable, because being smaller and lighter they are much less expensive to post.

There are a number of new titles recently added to the collection, so check the titles in the accompanying listing and see how easily your club can make use of this free service from the WIA.

John F Ingham, VK5KG
Federal Videotape Co-ordinator

AR

BOOK REVIEW

Evan Jarman VK3ANI
TECHNICAL EDITOR.

Towers' International Mospower & Other Fet Selector

T D Towers, G4GI, MA, BSc, C Eng, MIMechE and N E Towers, BA (Cantab)

TOWERS' INTERNATIONAL MOSPOWER & OTHER FET SELECTOR

This is a companion volume to Towers excellent transistor selector and it is just as good.

Already owning the transistor selector, which in four years has never let me down, I was keen to try the FET selector

Using a few European magazines as sources of exotic (for Australia) FETs, this new selector never missed. With some of the FETs I was given readily available substitutions. The others had a complete list of parameters, allowing circuit adjustments to be made, enabling the use of local equivalents.

The same test was tried using Japanese FETs, the results were the same although some did not have direct equivalents.

All small signal parameters are given including capacitances enabling design work. However the more specialised parameters are not given, for those the manufacturers need to be consulted. Manufacturers are listed, although these parameters (eg Sparameters) are for specialised design.

This is easily the best book of FET equivalents and parameters available and is recommended. It is an ideal companion for Towers' transistor selector Our review copy was supplied by the importer: ANZ Book Company, but should be on sale shortly The recommended Retail Price is $31 95.

AR

MAGAZINE REVIEW

Roy Hartkopf, VK3AOH
34 Toolangi Road A phington, Vic 3078

(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical (N) Of particular interest to the Novice.

CQ. July 1984. Specia VHF issue. (G) Simple 432 MHz helix. (C) Microphone Equalizer (C)

QST May 1984. Elimination of TVI (G) Q meter (C) Coils and Transformers (N) Amplifiers. (N)

VHF Communications, Vol 16 1/1984. Index for 1983. General VHF-UHF information Using Smith Charts. (T)

ORBIT. April 1984. Japan's first Amateur Radio Satellite. (G) General Amateur Satellite information

AMSAT OSCAR News. August 1984. Orbita. Calendar. (Aug Sept). Genera Oscar 10 information.

Ham Radio. June 1984. Towers — Design, Installation and Maintenance. (G) Impedance Matching Networks (T)

73 Magazine. July 1984. Cordless phones. (G) Construction using Perforated Board. (G) (N) Dayton Hamvention photographs. (G)

AR

ATTENTION!!!

A note from Neil Comish VK2KCN requests L Roberts of Wollongong to send his address to Neil so he may send the copy of the "Novice Contest Programme" which L Roberts has requested

AR

WIA VIDEOTAPE PROGRAMME TITLE LISTING as of 6/8/84

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod.	Approx. Dur.	Col/ B&W	Year Prod.	Description and Other Information
	GENERAL PROMOTIONAL FILMS						
–	The Ham's Wide World		ARRL	30 mins	Colour	1969	Superceded by "The World of Amateur Radio"
–	This is Amateur Radio		ARRL	15 mins	Colour	1970	Pitched at teenagers
–	Moving Up to Amateur Radio		ARRL	15 mins	Colour	1976	Pitched at CBers
©	7J1RL DXpedition		JARL	60 mins	Colour	1976	General amateur radio interest, *Loan Only*
–	This Week has 7 Days Looks into Amateur Radio		HSV7	25 mins	Colour	1978	Pitched at teens; includes some ARRL footage
	Amateur Radio – The National Resource of Every Nation		VK5KG	6 mins	Colour	1979	Encapsulates AR, good for public exhibitions
–	The World of Amateur Radio		ARRL	30 mins	Colour	1982	Pitched at adult level
	HISTORIC INTEREST						
©	Wireless Telegraphy – circa 1910		?	10 mins	B&W	1910	Archive material courtesy David Wardlaw, VK3ADW
–	Opening of Burley Griffen Bldg – SA HQ		VK5KG	50 mins	Colour	1977	Archive material
–	History of ATV in South Australia		VK5KG	30 mins	Colour	1980	Archive material, still building
–	ATV in Australia 1976 – made for British ATV Club		VK5KG	30 mins	Colour	1976	Archive material
–	ATV in United Kingdom 1976 – reply from BATC		G6CJ/5	30 mins	Colour	1976	Archive material
©	Heard Island Expeditions	ch	2,7,9,10	20 mins	Colour	1964	Archive material, *No Loan or Copy Available*
	ANTENNAS AND PROPAGATION						
©	G6CJ's Aerial Circus	G6CJ	WIA	90 mins	B&W	1977	The Definitive Antenna Lecture; *Loan Only*
–	Wire Antennas	VK5BO	VK5KG	40 mins	B&W	1978	Antennas for HF and Antenna Tuners
–	Loaded Wire Antennas	VK5HW	VK5KG	60 mins	Colour	1980	Using Inductive and Capacity loaded Antennas
–	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	60 mins	Colour	1983	How the Ionosphere aids HF communication
	SPACE – GENERAL INTEREST						
–	Apollo 13 Disaster	VK5JW	VK5KG	90 mins	Colour	1980	Australian tracking procedure saved Apollo 13
–	SSTV Pictures from Space – Voyager		VK5KG	15 mins	Colour	1983	SSTV pix converted from Saturn fly-past
*	Amateur Radio's Newest Frontier		ARRL	24 mins	Colour	1983	Shows "Ham in Space" – Shuttle STS-9
–	Ausat – Australia's Domestic Comms. Satellite	VK5JW	VK5KG	?	Colour	1984	In Production
	AMATEUR SATELLITES						
–	Lecture – Tracking Oscar	VK5HI	VK5KG	40 mins	B&W	1978	Superceded (see below)
–	Getting Started in Amateur Satellites	VK5HI & VK5AOR	VK5KG	60 mins	Colour	1983	Superceded (see below)
–	An Introduction to Amateur Satellites (Pt 1)	VK5AGR	VK5KG	60 mins	Colour	1984	An overview of Amateur Satellite working
–	Micro-Computer Aids to Satellite Tracking (Pt 2)	VK5AOR	VK5KG	30 mins	Colour	1984	Programmes for tracking & decoding telemetry
–	Using Phase III Amateur Satellites	VK5HI	VK5KG	90 mins	Colour	1984	History, construction & use of high orbit sats.
	DATA TRANSMISSION						
–	Lecture – RTTY	VK5QX	VK5KG	40 mins	B&W	1978	Superceded (see below)
–	Getting Started in Amateur RTTY	VK5JW	VK5KG	86 mins	Colour	1983	RTTY using Teleprinters and Micro-Computers
–	Amateur Packet Radio	VK5AGR	VK5KG	60 mins	Colour	1984	Theory and Demonstration
	AMATEUR COMPUTERS						
–	Demo of VK5ATV's Micro-Computer Controller # 1	VK5KG	VK5KG	10 mins	Colour	1979	First u-Computer controlled repeater in VK
–	Lecture – History of Micro-Processors	Rick Matthews	VK5KG	60 mins	Colour	1979	How somewhat dated, but still sound
–	Understanding Micro-Processors	VK5PE	VK5KG	60 mins	Colour	1980	A somewhat dated technical description
–	An ATV Hamshack Micro-Computer	VK5AHJ	VK5AHJ	10 mins	Colour	1981	Describes now unavailable Micro-Computer kit
–	Getting Started in Amateur Micro-Computers	VK5IF	VK5KG	33 mins	Colour	1983	Demo of hard & software for amateur radio
	AMATEUR TELEVISION – TECHNICAL						
–	The Signal to Noise Story	VK5ATV	VK5AHJ	45 mins	Colour	1982	Superceded by "UHF Pre-amplifiers" (see below)
–	UHF Preamplifiers	VK5ATV	VK5AHJ	45 mins	Colour	1983	Explanation and demo. of low noise preamps
–	Getting Started in Amateur Television	VK5KTV	VK5KG	35 mins	Colour	1983	How to set up an ATV station
–	Testing ATV Transmitters	VK5KG	VK5KG	30 mins	Colour	1983	How to correctly measure ATV systems
*	High Definition TV Tutorial	Don Fink	WB2LLB	60 mins	B&W	1983	A look at what is to come in broadcast TV
*	ATV Hamfest, York, Pennsylvania, Sept. '83	Various	WB2LLB	6 hrs	Colour	1983	Various ATV technical lectures from USA
	AMATEUR TELEVISION – ACTIVITY						
–	ATV in Australia 1980/81 – Made for British ATV CLUB		VK5KG	60 mins	Colour	1980	Clips from ATV Groups in VKs 2, 3, 4, 5 & 7
–	ATV in United Kingdom 1976/81		G6CJ/5	30 mins	Colour	1981	Remake of their previous effort
*	CQ ATV DX International 1983		WB2LLB	60 mins	Colour	1983	ATV in USA and Europe
–	ATV in Victoria, 1984		VK3AHJ	54 mins	Colour	1984	Courtesy of "The Roadshow Gang"
	AMATEUR TELEVISION – GENERAL INTEREST						
–	Low Definition Television	Chris Long	VK5KG	25 mins	Colour	1982	Re-creation of TV as transmitted by Baird
*	Overseas TV Clips about ATV, etc.		WB2LLB	60 mins	Colour	1983	Broadcast TV clips from USA and Europe
	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6 mins	Colour	1983	ATV camera & Tx mounted in a model aeroplane
	MISCELLANEOUS						
–	An Auxiliary Battery Charger	VK5HX	VK5KG	30 mins	Colour	1981	Charging a second mobile battery
–	Lecture – Winning Foxhunts	VK5TV	VK5KG	45 mins	Colour	1981	How to do it from one who has!
–	Getting Started in Amateur Construction	VK5AIM	VK5KG	50 mins	Colour	1983	Mechanical hints for novice constructors
	Comms. Consequences of Nuclear War	Dr. John Coulter	VK5ZBD	60 mins	Colour	1983	Why your gear may not survive even if you do!
–	The Far Eastern Broadcasting Company		VK5KG	60 mins	Colour	1984	How a Short Wave Broadcaster operates
	The Australian "Over the Horizon Radar"		VK5KG	60 mins	Colour	1984	How the "Australian Woodpecker" works

NOTE: © = Copyright; no copy service is available. * = Optically Converted to PAL from NTSC by WB2LLB; some flicker evident.

EDUCATION NOTES

Brenda Edmonds, VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive Frankston, Vic 3199

It is time again for all to test their skills with another amateur exam paper. This time it is the NAOCP Theory Test Paper — answers following the Hamads, this issue.

NAOCP Sample Examination Paper

Select the correct or most appropriate alternative

1 The unit of rate of electron flow is the
a coulomb
b volt
c ampere
d watt

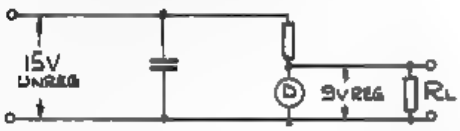
2 The filter in a power supply serves to
a convert input AC into smoothed DC
b smooth the AC before it is rectified
c double the ripple frequency and so reduce its amplitude
d remove some of the ripple from the output of the rectifier.

3 To use a 3.5 MHz crystal in a 21 MHz transmitter the multiplier stage would probably have
a one doubler and one tripler
b two doublers and a BFO
c three doublers
d two triplers

4 The detector stage of a superheterodyne receiver serves to
a amplify the audio frequency before it is mixed with the intermediate frequency
b convert the radio frequency output of the IF stage to an audio frequency
c provide a variable frequency to beat with the incoming radio frequency
d provide the voltage for the automatic gain control to be fed to the audio amplifier

5 Conduction in a thermionic vacuum tube occurs
a as soon as the cathode reaches the required temperature
b because of the attraction of the positively charged anode for the electrons
c when the cathode is at a higher potential than the anode
d only when the control grid is at a higher potential than the cathode

6 The device at D could be a



a gas regulator tube
b bridge rectifier
c zener diode
d voltage doubler

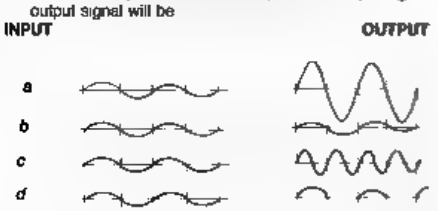
7 In a Field Effect Transistor the current flow is controlled by the
a voltage applied to the gate
b resistance of the source-drain junction
c type of current carriers
d polarity of the voltage applied to the base.

8 The polarisation of a radio wave refers to the
a direction in which the wave is travelling
b attenuation of the wave as it passes over ice masses
c direction of the electric field of the wave
d direction of the magnetic field of the wave

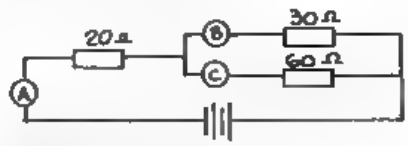
9 To achieve 100% amplitude modulation of a carrier by a single tone, the
a amplitude of the tone should equal the amplitude of the carrier
b frequencies of the tone and the carrier must be harmonically related
c amplitude of the carrier should be twice that of the tone
d amplitude of the tone should be 1% of the amplitude of the carrier

10 When an alternating voltage is applied to a P-N junction, conduction occurs
a whenever the applied voltage exceeds 0.2 volts in either direction
b when a positive potential is applied to the N side
c when the forward bias is high enough
d only when the PIV rating is exceeded

11 In a linear amplifier the relationship between input signal and output signal will be



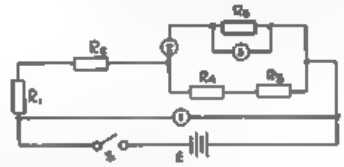
12 The current at B will be



a the same as at C
b equal to the current at A
c 30 milliamps
d twice that at C

13 A direct conversion receiver
a must have a beat frequency oscillator if it is to be used to receive CW
b has a local oscillator tuned to about the same frequency as the received signals
c cannot have a radio frequency amplifier stage
d usually has an intermediate frequency of about 10 MHz to aid image rejection.

14 To measure the resistance of R_3 it would be necessary to



a close switch S
b use an ohm meter at 3
c use an ohm meter at 2
d remove R_3 from the circuit

15 This symbol represents a

b point contact diode
c varicap diode
d germanium diode

16 Standing wave ratio is best measured
b half way between the transmitter and the antenna
c at the feed point of the antenna

17 Most dummy loads are labelled "50 ohms". This is because
a 50 ohm resistors are a convenient size for amateur use
b most modern transmitters are designed to operate most efficiently into a 50 ohm load.
c the feed point impedance of all antennas is 50 ohms
d 50 was the value first used by Ohm in his research into impedance.

18 A transformer has a turns ratio Primary: Secondary of 20:1 Assuming an efficiency of 100%, it would be expected that the output:
a voltage would be 20 times the input voltage
b power would be 20 times the input power
c current would be 20 times the input current
d impedance would be 20 times the input impedance.

19 Parasitic oscillations are generally caused by a
a overmodulation
b multiple harmonics
c overdriving of linear amplifiers
d unwanted resonances in the final amplifier circuits.

20 A dip meter does not need a power source if it is to be used
a to measure the resonant frequency of a circuit
b to tune a dipole antenna to approximately the desired frequency
c as a crude radio frequency oscillator
d to get an approximate frequency measurement from the final stage of a transmitter

21 A vertical antenna may be preferred to a horizontal antenna
a because it is less subject to noise pick-up
b because it can be fed with coaxial cable
c when directional effects are not wanted
d because of its high vertical radiation.

22 In a receiver with automatic gain control the gain of the Intermediate Frequency is controlled by the
a speaker output
b strength of the received signal
c audio gain control
d output from the carrier insertion oscillator

23 An antenna tuning unit is used to
a match impedances to give efficient power transfer
b tune the antenna to the correct length
c tune the transmitter
d increase harmonic radiation.

24 To reduce overload of a TV receiver by amateur HF transmissions, the most appropriate filter to be used would be a
a low pass filter at the transmitter
b narrow band pass filter at the transmitter
c narrow band pass filter at the receiver input
d high pass filter at the receiver

25 Propagation distance on 80 metres is greatest
a when the sunspot cycle is at a peak
b at night
c during the day
d when the D layer is most intense

26 A resistor is colour coded yellow, violet, orange, silver. Its value is about
a 48 Megohms 50% tolerance
b 35 Kilohms 5% tolerance
c 470,000 ohms 10% tolerance
d 47,000 ohms 10% tolerance

27 'Chirp' on a CW signal is due to
a a sharp on-off wave form
b oscillator instability
c nonlinearity of the power amplifier
d rough hand keying

28 For cross modulation to occur, the interfering station is usually
a very weakly received
b on a frequency close to the desired frequency
c very strong at the receiver input
d double the intermediate frequency away from the desired frequency

29 The feed point impedance of a half wave dipole antenna on 10 metres suspended several wave lengths above the ground will be about
a 72 ohms
b 25 ohms
c 300 ohms
d 600 ohms

30 Total resistance between A and B is

a 100 ohms
b 400 ohms
c 800 ohms
d 1,600 ohms

31 A cathode ray oscilloscope is *not* used to
a measure modulation percentage
b examine radio wave frequency changes
c demonstrate good CW characteristics
d measure resistance.

32 To use a moving coil meter to measure AC voltage it is necessary to use a
a large resistor in series
b parallel shunt
c zener diode shunt
d diode in series.

33 A linear amplifier is driven into non linear operation. The resultant signal may be said to
a squelch
b splash
c splatter
d downward modulate.

34 A microphone which depends on the piezoelectric effect for its operation is the
a crystal microphone
b dynamic microphone
c carbon microphone
d power microphone

35 A capacitance of 4,700 pF is the same as
a 4.70 µF
b 470 mF
c 0.047 µF
d 0.0047 µF

36 In single sideband transmission
a both carrier and one sideband are suppressed
b carrier and both sidebands are suppressed
c carrier and one sideband are eliminated
d all carrier is eliminated and one sideband enhanced.

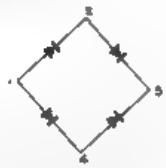
37 Two capacitors are identical in all respects except one. The one with the lower capacitance will be the one
a with aluminium plates instead of copper
b that has the greater plate area
c that has a mica electric instead of air
d that has the plates further apart.

38 In a triode vaccum tube, as the potential of the control grid is made increasingly negative,
a the rate of emission of electrons from the cathode is reduced
b increasing numbers of electrons are trapped by the grid
c the number of electrons reaching the anode is reduced
d grid current increases.

39 This circuit represents a

a pi coupler
b high pass filter
c low pass filter
d double tuned transformer

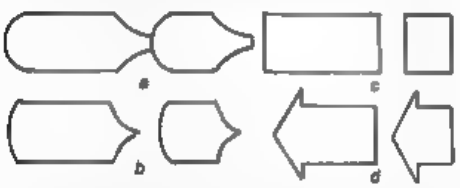
40 The output from this bridge rectifier circuit would



a be taken from terminals 1 and 3
b have a ripple frequency equal to that of the input AC
c be at a voltage approximately 1.4 times the peak input voltage
d be smoothed DC

41 An effective method of switching the antenna input between receiver and transmitter is by means of
a a change over relay
b a zener diode
c a gate circuit
d an antenna tuner unit.

42 If a good quality CW signal is displayed on an oscilloscope, the envelope pattern should appear as



43 The power output difference between two transmitters, is eight to one. This difference could be expressed as
a two decibels
b three decibels
c eight decibels
d nine decibels

44 A single conversion superheterodyne receiver has an intermediate frequency of 455 kHz. This means that when the set is tuned to receive 3.600 MHz, the local oscillator will be at
a 3.145 or 4.055 MHz
b 3.600 or 3.455 MHz
c 8.150 or 0.950 MHz
d 4.510 or 2.690 MHz

45 In a three element beam antenna the driven element is always
a slightly longer than the reflector
b located between the reflector and the director
c electrically linked on the one side to the director by an earthing tap
d at least one wave length away from the reflector

46 A simple method of matching balanced dipole to unbalanced coaxial feed line may use
a an antenna tuner
b a balun
c a matching insulator
d loosely coupled inductors

47 The points of minimum RF current are at the
a centre of any antenna
b feed point of any antenna
c ends of any antenna element
d transmitter output

48 The velocity of radio waves in free space is
a 300,000 metres per second
b 3,000,000 kilometres per second
c 300,000,000 metres per minute
d 300,000 kilometres per second

49 To ensure good frequency stability of a transmitted signal it is important to have
a a resonant antenna
b an efficient earthing system
c good neutralisation of the final amplifier stage
d a stable DC voltage supply for the oscillator stage

50 Many transistors are operated in conjunction with heat sinks. This is to
a dissipate heat produced and so prevent thermal runaway.
b raise the temperature of the transistor to the point where it operates at maximum efficiency.
c allow the transistor to be removed or tested without damage.
d use the heat produced in the transistor to provide a constant temperature for the oscillator stage.

AR

NEW FRENCH CALL SIGNS

French authorities are now issuing two letter prefixes, such as FC and FD to mainland French stations.

The new prefix for Corsica is now TK.

From Short Wave Magazine — June 1984

AR

"DOING THE BROADCAST"

Ted Holmes VK3DEH
20 Edmond Street, Parkdale, Vic 3195.

Some people may occasionally wonder what actually goes on at the Victorian Division's station VK3BWI during the Sunday Broadcast. Here is a short sketch of the behind-the-scenes action, from the point of view of one of the regular announcers.

I am driving along the Nepean Highway, heading for the Science Museum, at the corner of Swanston and Latrobe Streets, in the fair City of Melbourne. It's just after 9 o'clock on a Sunday morning and it's my turn to do the broadcast. As I travel along, I switch on the 2-metre rig and listen. There are two chaps talking and I wait for them to finish. Then I give Harry a call.

Harry VK3KBA is my fellow broadcaster for the day and he is also making his way to the Museum. We have a brief chat and a couple of other early Sunday risers call in as I get nearer the city.

Soon I arrive at the old and impressive Museum building and park at an empty parking meter. A free parking session today. I walk up the short path, beneath the trees and between the large bronze statutes at the entrance, up the stone steps and in a side door at the front. I go inside and speak to a man at the desk and he gives me a key.

I walk through a display of mining equipment in glass cases and get to a pair of glass doors bearing the legend "VK3AOM". I have arrived. Using the key, I open one of the doors and go into the darkened station. I switch on the lights and then insert another key into a switch and turn on the power.

I turn on another switch on the console and several rigs spring to life. A clock on the wall indicates 9.50. I turn another switch at the base of a tall rack of equipment until it shows green. Then I punch a button on the enormous 80m setup and a bunch of valves at the base glow vivid electric blue.

On the console there are magazines left by the operators who were at the station during the week: AR's, pamphlets and pieces of information for the public's edification. I put them to one side to clear a space and start sorting out the news items given me by David VK3YWZ the previous day. I go through last week's items to see if there are any repeats.

Whilst I'm doing this, Harry arrives. It is indeed a brisk morning. He utters greetings which I return and we then start to draw up a programme. First the intro, then the Federal tape. This is already in one of three tape recorders in a rack. We have a quick listen to check the beginning. Then we turn the logging tape over in the other recorder. All OK so far.

Next, Zone and Club news, followed by ATV news. I give Ron VK3AHJ a call on 147.630 MHz. He says OK he'll follow Zones and Clubs. Harry gives Barry VK3XY a call on 146.850 MHz. Yes, there will be DX news this week. Then he calls Peter VK3AVE. OK for satellite news. That will be four patches, including the tape patch. OK so far. It's 10.20 am.

People are talking on VK3RMM, the repeater used for the 2 metre portion of the broadcast. It's 10.25 am. I punch another button at the base of the 80m setup. It starts to hum. We quickly check a few dials. Everything seems to work. We wait.

It's 10.30 am. I throw the switch, Harry starts the recorders and switches on the 6 metre rig. Good morning. This is VK3BWI, ...'

I do the intro and we patch in the Federal tape, produced expertly by Bill Roper VK3ARZ. Harry and I have a chat, this being quite safe, since I had punched the tape patch button and our microphone isn't live.

Somebody is at the door. I let him in. He is a novice amateur and we greet him. He sits down on a green plastic chair and stares around at the rigs. It is difficult to tell if he is impressed. The studio certainly contains quite an amount of gear. The Federal tape starts winding up and Harry gets ready to punch the microphone button and release the tape patch. Push. 'Thank you Bill, and now for some Zone and Club news, the time being 9.43 ...'

Harry reads the various items, some hand written and hard to decipher, with no problems, and patches in Ron. There is no TV in the studio but we can hear Ron and imagine him in his famous peaked cap, looking at the viewers and given the latest information on the ATV scene.

It's 9.52 and so far, so good. We get to Dear Diary with no mishaps. Then I do the windup. It's 11 am. Pretty good, as we always aim for 30 minutes as an optimum length for the programme.

I kill all the rigs except 2 metres. As soon as we are off air there is a scramble of callers. We let it all die down and Harry does the callback, whilst I keep the log entries.

Country and mobile first. Good old Victor VK3BVJ gives his usual useful reports. Also George VK3GI from Woodend. Somebody else asks for a repeat on a phone number. We shuffle through papers and Harry gives it to him. Somebody else complains of deliberate interference. We thank him for calling in.

It's 11.20 am. Callbacks have finished. We switch off everything, close up and head straight for the Museum coffee shop, before going home for Sunday lunch.

AR

AMSAT AUSTRALIA

Colin Hurst VK5HI
8 Arndell Road Salisbury Park SA 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS

AMSAT AUSTRALIA
Control: VK5AGR
Amateur Checkin. 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter 3.580 MHz Summer: 7.064 MHz

AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz

AMSAT SW PACIFIC
Control: W6CG
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS

Contributions this month are from UoSAT Bulletin Number 88,17th August 1984, Bob VK3ZBB and Graham VK5AGR.

AMSAT AUSTRALIA MEETING

On Wednesday 15th August to coincide with a visit to Australia by Irving ZL1MO a meeting of AMSAT-Australia was convened in Sydney, and was chaired by Graham VK5AGR. The meeting was well supported by VK1 and VK2 members, and Peter VK7PF from Launceston. However those not able to make the meeting will be well catered for in a future issue of Amateur Radio, when an appraisal of the proceedings is presented. Additionally the meeting was taped and copies will be available on request from Graham VK5AGR.

UOSAT/OSCAR-11 GRAVITY GRADIENT BOOM DEPLOYMENT

Following several days final preparation and rehearsals, the UO-11 gravity gradient boom was deployed under on-board 1802 computer control at 10:35 UTC during orbit 2113 on 24th July. The automatic magnetorquing manoeuvres, continuously executed by the 1802 OBC (On Board Computer) over the previous few weeks had aligned the spacecraft closely to the geomagnetic field vector and reduced residual motions (wobble) to a very low value. Following final confirmation of auspicious deployment conditions at AOS at Surrey on orbit 2113, the OBC was given instructions to terminate the magnetorquing routines and deploy the boom for 15 minutes, taking the spacecraft out of range of the University of Surrey. The OBC simultaneously recorded X,Y,Z, +5V current and boom and computer status channels automatically throughout the operation whilst the boom was being deployed and during the following orbit, to monitor gravity gradient capture and spacecraft operations.

The stored data was dumped at UoS on the next orbit (2114) and examination confirmed the correct operation of the deployment routine and preliminary analysis of the stored Navigation Magnetometer data indicated successful gravity gradient capture. Data gathered regularly since then has confirmed that the spacecraft has maintained successful gravity gradient stabilisation and showed no evidence of severe libration. Residual energy before boom deployment translated itself into libration following GG-lock, which has been monitored and will be minimised using magnetorquing routines similar to those used during initial attitude control manoeuvres. The spacecraft will soon be spun very slowly around the Z-axis in order to improve the internal temperatures – currently running somewhat cool. Introducing a very slow Z-spin does, of course, interact with the GG stabilising forces but only to impart a small forward or backward 'tilt' of a few degrees, dependent on spin rate. Gravity gradient stabilisation of UO-11 is the culmination of many months of preparation and many weeks of spacecraft activities – most of which has not been visible to the outside world! It has been very demanding and has necessitated the use of considerable facilities and required a particular, dedicated effort from the UOSAT Team – particularly Stephen (Attitude, Stabilisation and Navigation Analysis), Roger G8NEF (Spacecraft Software) and Neville G8NOB (Ground Station Software). Tnx UoS Bulletin-#88.

On behalf of all VK satellites I would like to express appreciation and gratitude to The University of Surrey UoSAT Team for a job well done. *Bewdy Newk!*

OSCAR 10 APOGEES

The following explanation as to how to apply the Oscar 10 Apogees which appears in this column each month stems from a recent lecture that I presented on Oscar 10. It was whilst researching that lecture and preparing some slide material that I realised that my comments in the December 1984 issue, although technically correct, do require further clarification. Oscar 10 is in an orbit known as a Molinya Orbit, widely employed and named by the Soviet Union. In essence it is an elliptical orbit in which the spacecraft appears "fixed" in space, as viewed by an observer on earth. Therefore, the problem of tracking the spacecraft becomes less of a hassle. However there are complex factors that ensure that the space craft is not "fixed" in space, factors that we will not pursue in this discussion. Suffice to say however, within the constraints of beam-widths of radio antennae from a practical point of view it does appear "fixed".

Observation of the Apogee Table indicates that the satellite appears on a 15-day cycle. The explanation will centre on specific tables for the Centre, End and Start of a cycle, Tables 1, 2 and 3 respectively. The tables are for Adelaide and the headings left to right are Time, Beam Headings Az-El, Phase/Mean Anomaly – (Refer explanation below), Satellite Co-ordinates Lat and Long, Satellite Range and Height above Earth.

Table 1 is for 16th October (Centre of Cycle), and is a Printout for Adelaide for ± 5 hours about Apogee at 30 minute increments. Apogee occurs at 0949:50 (Refer Apogee Table also) at Phase 128. You will note that for ± 4 hours about Apogee that Oscar 10 is within the beam-width of a typical uplink/downlink antenna, and rotator readout. Therefore from an operating aspect all you need to do is look up the Apogee Table for the respective day and set your antennae to the headings shown, and you are in business for 8 hours of operating. Nonetheless it is a wise operating practice to peak on the satellite beacon, every hour or so, if you have any doubts as to your beamwidths or rotator readout. This rule of thumb applies to the group of available orbits grouped in the centre of the Pass. Nonetheless at the start and end of each 15-day cycle there are limitations to be observed.

Table 2 is for the 22nd October (End of Cycle). Apogee is at 0544:34 (Phase 128). You will note that we are now restricted to 1 hour prior to Apogee. However 3 hours after Apogee is still available, but at the expense of elevation adjustment.

Table 3 is for the 28th October (Start of Cycle). Apogee is at 1319:43 (Phase 128). Here we note the converse of the End of Cycle, 3 hours prior to Apogee and 1 hour after Apogee.

Conclusions:
(VK5HI Rules of thumb)

1 *Start of Cycle.* *Approx 3 hours prior to Apogee*
Approx 1 hour after Apogee
2 *Centre of Cycle* ± 4 hours around Apogee
3 End of Cycle Approx 1 hour prior to Apogee
Approx 3 hours prior to Apogee
4 Start of Cycle merges into Centre Cycle in 2 to 3 days.
5 End of Cycle emerges from Centre Cycle over 2 to 3 days.

These rules of thumb are applicable to Sydney, Adelaide and Perth for the figures given in the Apogee Table.

Phase/Mean Anomaly Explanation.

Mean Anomaly is angular displacement of spacecraft from Perigee (Refer January 84 AR Page 46 for detailed definition). Namely MA = 0 Deg is Perigee, MA = 180 Deg is Apogee, MA = 360 Deg is Perigee. However, the spacecraft's computer works with hexadecimal numbers, consequently the Mean Anomaly (or Phase-W3IWI Programme) telemetred by the spacecraft is referenced to 256 Bits, that is to say, Mean Anomaly = 180 degrees equates to 128 Bits, similarly 360 degrees equates to 256 Bits. Note from Tables 1-3 that 30 minutes of time equates to 11 Bits, and this is a value to remember, especially with the revised schedule on Oscar 10 (Sept AR). By listening to the beacon and obtaining the telemetred value of the Mean Anomaly/256 you can calculate the respective mode switching times.

de Colin VK5HI
AR

Tables 1, 2 and 3, Apogees and Satellite Ups and Downs on following page.

CONCERN ABOUT SATELLITE TV RECEIVERS

The RSGB is "particularly concerned" that the intermediate frequencies being considered for satellite TV receivers will be close to the 1.3 GHz and 144 MHz amateur bands.

It is believed the Japanese are about to adopt these bands (specifically the first IF would be established in the range 950-1350 MHz, and the second intermediate frequency would be set to 134 MHz with an associated bandwidth of 27 MHz). Germany and Holland are likely to adopt the same frequency bands.

The RSGB, in technical material prepared for the Department of Trade & Industry, determined that the signal strength associated with short transmitter/receiver paths characteristic of the 144 MHz and 1.3 GHz bands are sufficiently high as to cause serious RFI problems. "Unless the DBS (direct broadcast satellite) receiver system is designed to cope with such high signal levels, either from amateurs or other sources," warned the Society, "then there will be a high risk of breakthrough."

adapted from CQ — June 1984

AR

QSL BUREAU

The address of the US Third Call Area QSL Bureau is as follows:

Cumberland County Amateur Radio Service
PO Box 448
New Kingstown, PA 17072-0448
USA

The callsign prefixes for the U.S. third call area are:

AA-AK3	*K3*
KA-KZ3	*N3*
NA-NZ3	*W3*
WA-WZ3	

AR

TABLE 1 – AMSAT OSCAR 10

UTC HHMM:SS	Az Deg	El Deg	Phase (256)	Lat Deg	Long Deg	Range km	Height km
	16th October		Day Number 290			Orbit Number 1019	
0449:50	339	12	18	19	239	14385	10580
0519:50	359	15	29	24	224	19585	15755
0549:50	6	16	40	26	216	24155	20285
0619:50	10	17	51	26	212	27964	24125
0649:50	11	19	62	25	211	31080	27332
0719:50	11	21	73	24	211	33576	29856
0749:50	10	23	84	34	212	35510	32041
0819:50	9	24	95	22	214	36934	33625
0849:50	6	26	106	21	216	37883	34737
0919:50	3	28	117	19	218	38375	35388
0949:50	0	30	128	18	221	38426	35591
1019:50	357	31	139	16	224	38038	35347
1049:50	353	33	150	15	227	37209	34655
1119:50	349	34	161	13	229	35920	33501
1149:50	346	36	172	11	232	34150	31869
1219:50	342	38	183	8	234	31863	29737
1249:50	340	40	194	5	235	29001	27061
1319:50	338	42	205	2	235	25493	23797
1349:50	339	47	216	–3	233	21252	19865
1419:50	347	54	227	–9	227	16193	15294
1449:50	27	60	238	–18	213	10618	10063

TABLE 2 – AMSAT OSCAR 10

UTC HHMM:SS	Az Deg	El Deg	Phase (256)	Lat Deg	Long Deg	Range km	Height km
	22nd October		Day Number 295			Orbit Number 1022	
0414:34	57	–2	95	22	157	39684	33569
0444:34	57	1	106	20	160	40515	34718
0514:34	56	4	117	19	162	40865	35379
0544:34	55	7	128	17	165	40749	35357
0614:34	55	10	139	16	168	40180	35591
0644:34	54	13	150	14	171	39159	34673
0714:34	53	16	161	12	173	37684	33529
0744:34	53	19	172	10	176	35745	31909
0814:34	53	22	183	8	178	33321	29784
0844:34	54	24	194	5	179	30387	27120
0914:34	57	26	205	1	179	26926	23874
0944:34	63	26	216	–3	177	22935	19985
1014 34	73	22	227	–10	172	18533	15399

TABLE 3 – AMSAT OSCAR 10

UTC HHMM:SS	Az Deg	El Deg	Phase (256)	Lat Deg	Long Deg	Range km	Height km
	28th October		Day Number 302			Orbit Number 1035	
0949:43	312	–1	51	26	275	29854	24075
1019:43	313	2	62	25	273	32844	27267
1049:43	312	3	73	24	274	35354	29916
1119:43	310	4	84	23	275	37398	32009
1149:43	308	4	95	21	277	38986	33602
1219:43	305	4	106	20	279	40152	34723
1249:43	303	3	117	18	282	40898	35381
1319:43	300	2	128	17	284	41209	35591
1349:43	297	1	139	15	287	41086	35354
1419:43	293	0	150	13	290	40521	34672
1449:43	290	–1	161	11	293	39482	33525

OSCAR–10 APOGEES, OCTOBER 1984

DATE OCT.	DAY #	ORBIT #	APOGEE UTC HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	SATELLITE CO-ORDINATES LON DEG	BEAM HEADINGS SYDNEY Az DEG	SYDNEY El DEG	ADELAIDE Az DEG	ADELAIDE El DEG	PERTH Az DEG	PERTH El DEG
1	275	979	0821 14	19	186	25	25	38	18	56	6
2	276	981	0740:20	19	177	35	21	46	13	62	–1
3	277	983	0658:25	19	167	43	15	53	7		
4	278	985	0618:30	19	158	51	10	59	1		
5	279	987	0537:33	19	149	57	3				
6	280										
7	281	992	1556:41	19	305					302	4
8	282	994	1515.47	19	296					308	11
9	283	996	1434:52	19	287			300	–0	315	17
10	284	998	1353.54	18	277	297	–2	306	6	323	22
11	285	1000	1313:00	18	268	303	5	313	12	332	27
12	286	1002	1232:05	18	259	310	11	320	18	343	30
13	287	1004	1151 10	18	249	317	17	329	23	354	32
14	288	1006	1110:13	18	240	326	22	339	27	6	32
15	289	1008	1029:18	18	230	335	26	348	29	17	31
16	290	1010	0908:55	18	221	345	29	0	30	27	28
17	291	1012	0949:50	18	212	356	31	11	29	37	23
18	292	1014	0827:58	18	202	8	30	22	27	45	16
19	293	1016	0747:03	18	193	19	29	32	23	52	12
20	294	1018	0706:08	18	184	29	25	41	18	59	5
21	295	1020	0625 13	18	174	38	21	49	13	64	–2
22	296	1022	0544.18	17	165	46	15	55	7		
23	297	1024	0503.21	17	156	53	9	62	–0		
24	298	1026	0422:26	17	146	60	3				
25	299	1029	1522:30	17	312					296	–0
26	300	1031	1441 35	17	303					302	7
27	301	1033	1400:38	17	294					308	13
28	302	1035	1319:43	17	284			300	2	316	20
29	303	1037	1238:48	17	275	297	0	306	9	324	25
30	304	1039	1157:51	17	266	303	7	313	15	334	30
31	305	1041	1116:56	17	258	310	14	321	21	345	33

SATELLITE ACTIVITY FOR PERIOD MAY 30 TO JUNE 26, 1984

1. LAUNCHES

NUMBER	NAME	NATION	DATE OF LAUNCH	INITIAL DATA PERIOD MINS	INITIAL DATA APOGEE KM	INITIAL DATA PERIGEE KM	INITIAL DATA INCLN DEG	REMARKS
1984–53A	COSMOS 1567	USSR	MAY 30	93 3	482	428	65	SI TM
54A	COSMOS 1568	USSR	JUNE 1	90.2	396	209	72 8	SI TM
55A	COSMOS 1569	USSR	JUNE 6	710	40165	614	62 8	SI TM
56A	COSMOS 1570	USSR	JUNE 8	100 9	830	792	74	SI TM
57A	INTELSAT VF9	USA	JUNE 9	99 3	1217	229	28 7	CS 4-6 GHz
58A	COSMOS 1571	USSR	JUNE 11	—	—	—	—	
59A	NNN	—	JUNE 13	—	—	—	—	
60A	COSMOS 1572	USSR	JUNE 15	89.4	297	227	82 4	SI TM
61A	COSMOS 1573	USSR	JUNE 19	89 4	317	209	72 9	SI TM
62A	COSMOS 1574	USSR	JUNE 21	105	1021	985	83	S TM
63A	RADUGA	USSR	JUNE 22	1397	35100	—	1 3	TV, GS
64A	COSMOS 1575	USSR	JUNE 22	89.4	292	231	82 3	SI TM
65A	NNN		JUNE 25	—	—	—	—	
65C	NNN		JUNE 25	—	—	—	—	
66A	COSMOS 1576	USSR	JUNE 26	—	—	—	—	

2. DECAYS

The following satellites decayed or were recovered:–

1984–48A	COSMOS 1557	4 JUNE
58A	COSMOS 1571	26 JUNE
60A	COSMOS 1572	29 JUNE
61A	COSMOS 1573	28 JUNE

together with 35 other objects.

3. PRELAUNCH REPORT

NAME: Geostationary Meteorological Satellite – 3 (GMS 3)
COUNTRY: Japan
PLANNED LAUNCH: 1 August 1984

PREDICTED ELEMENTS

Orbit Type	Geostationary
Period, min.	1436
Apogee, Km	35,786
Perigee, Km	35,786
Longitude	140° E
Gross Weight	300kg

Launch Agency: National Space Development Agency of Japan.
Mission Objectives:
Acquisition of Meteorological Data.
Distribution of Meteorological Data.
Meteorological Observations.
Monitoring Solar Protons.
Transmitting on 2280.72 MHz at 2.8 W.

CONTESTS

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER

P O. Box 1234, GPO, Adelaide, SA 5001

CONTEST CALENDAR.

October

6-7 VK/ZL/Oceania DX Contest, phone.
13 — 14 VK/ZL/Oceania DX Contest, CW.
17 — 18 YLRL Anniversary CW Party.
18 — RSGB 21MHz CW Contest.
27 — 28 CQ World Wide DX Phone Contest. (Rules this issue.)
31 — 1 Nov YLRL Anniversary Phone Party.

November.

10 Australian Ladies Amateur Radio Association. ALARA Contest. Combines Phone and CW. (Rules this issue.)
24 — 25 CQ World Wide DX CW Contest. (Rules this issue.)

I have received a letter from Margaret VK3DML who is the Contest Manager for ALARA. Margaret has asked me to specifically emphesise the inception of the Mrs McKenzie Memorial Trophy in association with this years ALARA Contest. There is no doubt that Mrs Mac was a most remarkable woman. Perhaps at some stage one of our YL members may like to research some more of her history and write up some more details about her. If you have any information I am sure that Margaret would be very pleased to hear from you. Were any of you trained by Mrs Mac whilst you were in the services?

These notes are being written on 22nd August, just a few days after the RD Contest. Already the logs are coming in. I do hope that the logs entered comply with the requirements of the rules otherwise we may have to disqualify some.

LETTERS AND COMMENTS

I have already been receiving comments on rules for contests, comments on my first writings for this column and quite a lot of complaints about the mistakes in the RD Contest rules. Again I hasten to point out that these latter were NOT provided by me. I hope that in future such problems will not arise as all my copy sent to Amateur Radio for Australian contests is original material specifically typed for the purpose. This should help to solve some of the problems. I appreciate your letters and suggestions, however I do not promise to answer all letters received. I would like to see many more of you writing in with your thoughts on Australian Contests. The Editor has agreed to publish selections from your comments.

I have already provided editorial material for this column which generally discusses the subject of contests and their operation, in fact enough to do up until next February's issue. This means that for the present I should be able to concentrate on getting such matters as contest rules off the ground, clear the logs for the RD Contest, sort out the Contest Champion Trophy points problems when the VK/ZL results from last year become available.

FIELD DAY CONTEST CERTIFICATES

I have received a query about the issue of certificates for the 1984 Field Day Contest. As far as I have been able to tell there is no record of any details of these amongst the material passed along to me upon my taking up the FCM position. I will thus be referring this matter to the Federal Executive similarly to that of the 1983 RD Contest Certificates.

NOVICE CONTEST CERTIFICATES

Again I have no information as to the current situation regarding these. If people are not in receipt of certificates for this contest please bear with me while I try to sort this matter out.

AUSTRALIAN LADIES' AMATEUR RADIO ASSOCIATION ALARA CONTEST

ELIGIBILITY All licensed operators throughout the world are invited to participate. Also open to SWLs.

OBJECT PARTICIPATION! YL works everyone, OM works YLs only.

One contest (combined phone and CW) run over 24 hours.

STARTS Saturday 10th November 1984 at 0001 hours UTC.

ENDS Saturday 10th November 1984 at 2359 hours UTC.

SUGGESTED Bands to be used are: 3.5, 7, 14, 21 and 28 MHz only.

FREQUENCIES the following are suggested frequencies for easier location of contacts:

CW	PHONE
28.100 to 28.200	28.480 to 28.520
21.100 to 21.200	21.180 to 21.200
14.050 to 14.060	21.350 to 21.370
7.010 to 7.020	14.180 to 14.200
3.525 to 3.535	14.280 to 14.300
	7.100 to 7.120
	3.570 to 3.590

OPERATION Phone and CW operation. Each station may be counted twice on each band for credit: once on phone and once on CW. All contacts must be made in accordance with operator and station licence regulations. No net or list operations, no crossmode.

PROCEDURE: Phone: call "CQ ALARA CONTEST" CW: call "CQ TEST ALARA"

EXCHANGES: ALARA member RS or RST, serial No starting at 001, ALARA member, name. YL non-member or OM: RS or RST, serial No starting at 001, [redacted].

SCORING:

Phone: 5 points for ALARA member contacted
4 points for YL non-member contacted
3 points for OM contacted
CW: Double all points for C.W. contacts.
SWL: 5 points for ALARA member logged.
4 points for YL non-member logged.

LOGS Single log entry (but Australian YL novices entering for the Mrs Florence McKenzie CW Trophy should indicate their CW score separately also). Logs must show date/time UTC, band, mode, callsign worked, report and serial number sent, report and serial number received, name of operator of station worked, and points claimed.

SAMPLE LOG:	Date/Time UTC	Band MHz	Mode	Callsign	RS(T) & serial No sent	RS(T) & serial No rec'd	Name	Points
	10/11 0135	28	SSB	VK3DML	59001	58028	Margaret	5
	0141	21	CW	VK2SU	599002	599045	Freda	10

LOGS MUST BE SIGNED. Logs also to show full name, callsign and address of operator, and show final score (points claimed). Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final. Logs must be received by the Contest Manager *by 31st December 1984.*

CONTEST MANAGER: Mrs Margaret Loft VK3DML, 26 Lawrence Street, Castlemaine, Victoria, Australia, 3450

A TROPHY will be awarded for the highest aggregate score over 5 years (commencing 1983) of a licensed YL operator (not necessarily Australian).

MRS FLORENCE McKENZIE CW TROPHY This will be awarded to the Australian YL novice operator with the highest CW score (not necessarily an ALARA member). Minimum score 50 points. The actual trophy, because of the size and weight, will not be forwarded to the winner, but a certificate bearing a photo depicting the trophy will be sent to the winner each year.

CERTIFICATES will be awarded for the following:

Top score overall
Top score Australian YL novice CW (Mrs McKenzie certificate)
Top score ALARA member in each country and VK call area
Top score YL non-member in each continent
Top score OM in each continent
Top score SWL in each continent
Top score VK novice
Top score overseas YL novice CW

(Mrs Florence Violet McKenzie 1892-1982 was the first woman in Australia to take out a transmitting licence, in 1921. She passed the Amateur Operator's Certificate of Proficiency in 1925 and obtained the callsign 2GA (later VK2FV). Mrs Mac taught Morse code to thousands of people, particularly service personnel during the 1939-45 war years. In 1984 the Townsville Amateur Radio Club kindly donated a trophy in her memory.)

1984 CQ WORLD-WIDE DX CONTEST

Phone. 27-28 October 1984, 0000 UTC Saturday to 2400 UTC Sunday

CW: 24-25 November 1984, 0000 UTC Saturday to 2400 UTC Sunday

OBJECTIVE: For amateurs around the world to contact other amateurs in as many zones and countries as possible

BANDS. All bands, 1.8 through 28 MHz

TYPE OF COMPETITION: 1 Single Operator (single band and all band) Single operator stations are those at which one person performs all of the operating, logging, and spotting functions. The use of DX spotting nets or any other form of DX alerting assistance places the station in the Multi-Operator category.

2 Multi-Operator (all band operation only).

a Single Transmitter, only one transmitter and one band permitted during the same time period (defined as 10 minutes)

Exception: One—and only one—other band may be used during the same time period if—and only if—the station worked is a new multiplier. Logs found in violation of the ten-minute rule will be automatically reclassified as multi-multi to reflect their actual status.

b Multi-Transmitter (no limit to transmitters but only one signal per band permitted).

c All transmitters must be located within a 500 metre diameter or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitter.

3 QRPp (single operator only) Power must not exceed 5 watts output. Stations in this category will be competing only with other QRPp stations for awards.

4 Team Contesting. A team consists of any five radio amateurs operating in the single operator category. A person can be on only one team per mode. A team must operate from two continents. Competing on a team will not prevent any team member from submitting his personal score for a radio club. A team score will be the sum of all the team member scores. SSB and CW teams are totally separate. That is, a member of an SSB team can be on a totally different CW team. A list of a team's members must be received by 15 October for SSB and 15 November for CW. Send the list to CQ Att: Team Contest, 76 North Broadway, Hicksville, NY 11801 USA. Awards will be given to the top five teams. A list of a team's members' scores plus the total team score must be submitted to CQ by the normal contest log deadlines.

NUMBER EXCHANGE: Phone: RS report plus zone (ie 5705) CW: RST report plus zone (ie, 57905)

A station in a zone or country different than that indicated by its call sign is required to sign portable.

MULTIPLIER: Two types of multiplier will be used.

1 A multiplier of one (1) for each different zone contacted on each band.

2 A multiplier of one (1) for each different country contacted on each band.

Stations are permitted to contact their own country and zone for multiplier credit. The CQ Zone Map, DXCC country list, WAE country list, and WAC boundaries are standards.

POINTS: 1 Contacts between stations on different continents are worth three (3) points.

2 Contacts between stations on the same continent but different countries, one (1) point.

3 Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero (0) point value

SCORING. All stations the final score is the result of the total QSO points multiplied by the sum of your zone and country multiplier

Example: 1000 QSO points x 100 multiplier (30 Zones + 70 Countries) = 100,000 (final score).

AWARDS: First place certificates will be awarded in each category listed under type of competition in every participating country and in each call area of the United States, Canada, Asiatic USSR, and Japan.

All scores will be published. To be eligible for an award, a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award only. If a log contains more than one band it will be judged as an allband entry, unless specified otherwise.

In countries or sections where the returns justify, 2nd and 3rd place awards will be made.

All certificates and plaques will be issued to the licensee of the station used.

TROPHIES & PLAQUES

There is a most comprehensive list of trophies for both Phone and CW operation for various areas, multi-band and single band operation etc. For space reasons the list is not published here.

Trophy winners may win the same trophy only once in a two-year period. In the event that the same station wins the same category in two consecutive years, a special CQ Magazine Championship plaque will be awarded the second year. The sponsored trophy in that category will then be awarded to the second-place finisher in that category if the returns justify the award.

A station winning a World Trophy will not be considered for a sub-area award. That Trophy will be awarded to the runner-up of that area.

CLUB COMPETITION:

1 The club must be a local group and not a national organization.

2 Participation is limited to members operating within a local geographic area defined as within a 275 km radius from centre of club area (except for DXpeditions especially organized for operation in the contest)

3 To be listed, a minimum of 3 logs must be received from a club and an officer of the club must submit a list of participating members and their scores, both on phone and CW.

LOG INSTRUCTIONS.

1 All times must be in UTC.

2 All sent and received exchanges are to be logged.

3 Indicate zone and country multiplier only the FIRST TIME it is worked on each band

4 Logs must be checked for duplicate contacts, correct QSO points and multipliers. Submitted logs must have duplicate contacts clearly shown. The *original* log may be requested by the Contest Committee if further cross-checking of the log is necessary

5 Use a separate sheet for each band.

6 Each entry must be accompanied by a summary sheet showing all scoring information, category of competition, contestant's name and address in BLOCK LETTERS, and a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

7 Sample log and summary sheets and zone maps are available from CQ. A large self-addressed envelope with sufficient postage or IRC's must accompany your request.

If official forms are not available, make up your own 80 contacts to the page on 8½" x 11" paper

8 All entrants are required to submit cross-check sheets for each band on which 200 or more QSO's were made. All other entrants are encouraged to submit cross-check sheets.

9 Duplicate contact penalty: up to 1%—three (3) additional contacts removed; 1% to 3%—ten (10) additional contacts removed; over 3% is grounds for possible disqualification.

10 QRPp stations must indicate same on their summary sheets and state the actual maximum power output used, with a signed declaration.

DISQUALIFICATION: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct, taking credit for excessive duplicate contacts, unverifiable QSO's, or unverifiable multipliers will be deemed sufficient cause for disqualification. (Incorrectly logged calls will be counted as unverifiable contacts.)

An entrant whose log is deemed by the Committee to contain a large number of discrepancies may be disqualified from eligibility for an award, both as a participant operator or station, for one year. If an operator is disqualified a second time within 5 years, he will be ineligible for any CQ contest awards for 3 years.

Actions and decisions of the CQ Contest Committee are official and final.

DEADLINE: All entries must be postmarked NO LATER than 1 December, 1984 for the Phone section and 15 January, 1985 for the CW section. An extension may be given if requested. Indicate phone or CW on envelope.

Both phone and CW logs should be sent to CQ Magazine, 76 North Broadway, Hicksville, NY 11801

RULES FOR RSGB 21MHz CW CONTEST 1984

TRANSMITTING SECTION

Eligible entrants Overseas: All licensed amateurs.

Period 0700 to 1900 UTC, Sunday 21 October, 1984.

Sections (a) British Isles.

(b) QRP British Isles stations using less than 10W input.

(c) Overseas (including Eire).

(d) QRP Overseas stations using less than 10W input.

Frequency and mode 21MHz only. CW only. Entrants are requested not to operate in the band 21.075 to 21.125MHz

Exchange RST report and serial number starting at 001

Scoring Overseas stations: Three points for each completed contact with a station in British Isles. The final score is the number of British Isles prefixes multiplied by the total number of points. British Isles prefixes are G2, G3, G4, G5, G6, G8, G0, GD2, GD3, GD4, GD5, GD6, GD8, GD0, GI2, GI3, GI4, GI5, GI6, GI8, GI0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GJ0, GM2, GM3, GM4, GM5, GM6, GM8, GM0, GU2, GU3, GU4, GU5, GU6, GU8, GU0, GW2, GW3, GW4, GW5, GW6, GW8, GW0. Contacts with GB stations will not count for points or multipliers.

Duplicate contacts: Unmarked duplicate contacts for which points have been claimed will be penalised at the rate of ten times the claimed points. Entries with more than five unmarked duplicates will be disqualified.

Logs Log sheets to be headed date, time UTC station worked, RS and serial number sent, RS and serial number received, multiplier points claimed.

Declaration With each entry there must be a declaration, signed and dated, that the station was operated within the rules and that the decision of the Council of the RSGB shall be final.

Address for logs RSGB HF Contests Committee, c/o Mr R A Treacher, 79 Granby Road, Eltham, London SE9 1EH, England.

Entries to arrive by 31 December 1984.

[redacted] leading stations in each section, and to the leading station in each overseas country.

RECEIVING SECTION

Rules as for the transmitting section except as varied below.

Eligible entrants All SWLs. Note that holders of transmitting licences for frequencies above 30MHz may enter the receiving [redacted]

Scoring Overseas SWLs should only log British Isles stations in contact with overseas stations taking part in the contest. Scoring and multipliers as the transmitting section.

Logs Logs to be headed: date, time UTC, callsign of station heard, RST and serial number sent by station heard, callsign of station being worked, multiplier, points claimed.

Note: In the column headed station being worked, the same callsign may only appear once in every three contacts logged except when the logged station is a new multiplier for the receiving station. Also the station heard may only be logged once for the purposes of scoring.

Declaration Each log must be accompanied by the following declaration: "I declare that this station was operated within the rules of the contest and I do not hold a transmitting licence for frequencies below 30MHz."

Awards Certificates of merit will be awarded to the leading three entries in each overseas country.

This month I have decided to discuss some aspects of station operation and equipment as far as contests are concerned. Generally speaking a reasonably well set up station is a necessity for contest working, however this does not mean that the station must be a really elaborate one. By well set up I imply that the amount of thought put into station layout, ease of selection of different equipments, such as antennas, filters etc, plays a large part in establishing a station suited to contest work. Such an approach will not only result in a station established for this purpose alone but will provide one which can be a pleasure to operate under any circumstances, for DXing, ragchewing or just general listening around. Just that little bit of extra thought is all that is needed

The remarks made so far assume in the main that the station is being set up as a Home Station and not as a portable or mobile, where some other aspects come into play. This latter case we will discuss later.

Antenna selection in a contest is very important and should be quick and easy. Such selection should follow a logical sequence, eg the lowest frequency antenna on position 1 of the switch through to the highest frequency on, say, position 5. Control and switch positions should be clearly marked. As part of the antenna feed system a low VSWR can be obtained by the use of coaxial switches and relays although these can be rather expensive. Good results can be obtained by using cheaper and more conventional switches if they are properly mounted, perhaps in a metal box and care taken with the wiring.

Headphones should always be on hand and in some cases it may be of benefit to wear them continuously. This can only be tolerated if the headphones are a comfortable fit. Excessive audio gain should not be used with headphones as this can become most tiring with long periods of use.

Audio band-pass, as well as notch type filters, can play a useful part in helping sort out signals on a crowded band either in phone or CW modes. These need not be too elaborate as they can be quite simply and cheaply built using 'Op Amp' type integrated circuits. Just look through some back issues of most amateur radio magazines and you will find plenty of typical circuits you can adapt to your own use.

Microphone placement is important. It should not be where you have to strain forward to speak into it, however be careful about the use of such accessories as compressors, processors, preamps etc, as these can run you into some troubles.

One most useful adjunct in any station is a foot operated switch to allow you to change the station from receive to transmit and vice-versa. This allows you to have both hands free to manipulate your pens, log sheets and check sheets, or computer terminal, and press the intercom button to order more drinks from the kitchen.

It is also necessary to devise systems to select various pieces of apparatus as part of the working set up as they are needed. This would include units such as antenna tuner, audio filter, additional headset for assistant log-keeper, hand or electronic Morse keyer etc.

Much thought should be given to the location and installation of antennas as well as selection of most appropriate designs. Orientation of fixed antennas deserves a careful look although the limitations of many suburban backyards will certainly play a part here.

If you are one of the lucky ones you may be able to obtain enough equipment to provide redundancy of the main items such as HF transceiver. In this case you will probably wish to have one unit tuned up on one band and the second, or spare, used for either band spotting or for a fast QSY to another band. If you have one rig for each band you maybe don't need too much in the way of this advice as you are obviously very keen, maybe rich or else foolish with your money. Either way you should make sure that such changes as you do make can be carried out quickly and easily and that each unit can be readily connected to each other piece of equipment likely to be required as part of the configuration. It is a very good plan to try and standardise as far as possible on the type of connectors in use, such as RF, audio and power supply connectors, and to use the fewest types possible.

It is most important that you check out fully all equipment utilised in the station well in advance of any contest and investigate any apparent fault conditions or

unusual anomalies. It is just a little too late to find out that the tubes in that valve final have gone soft part way through the contest and not only have to replace but carry out the neutralisation adjustment as well. Make sure that you have arranged sufficient space for ventilation around items which produce heat either valve type units or solid state. If needs be have a fan or fans placed in strategic locations to move the air about and add blowers to equipment where this can be done.

All the above applies irrespective of whether your station is intended for mainly HF of VHF operation. If it is a mixed HF/VHF installation it could pay to set things up to provide virtually two separate stations depending on space availability. Space should also be available for additional items including drink, food, operating aids such as countries lists, spare pens and pencils all placed within easy reach.

Prior to the contest, as part of the overall station checkout, you should familiarise yourself with each item of equipment and all modes of operation which you are likely to use. You should be well aware of the correct readings for all indicators such as meters, monitor lights etc, and also know from memory such items as correct VSWR indications for each antenna. If in any doubt about any item check it and then re-check it. Where quite a number of settings would need to be known, such as with an antenna coupler, make out a large and very legible chart or table showing the settings. Make sure that you carry out quite a number of dummy runs in the various station configurations you may require. Provide as much in the way of metering, monitoring and fault indicating devices as you reasonably can.

Make sure that you are operating all items of equipment within their limits of capability. It is just as well to err on the conservative side if any doubt exists. It does not do anything to help you produce a good clean signal, and thus more effective in a contest or at any other time, if you are flogging everything to the limit. I believe every station should be required to have as part of its equipment a monitor oscilloscope. Let me retail a true story. Don Millar (the late VK5PX) once brought me his Heathkit SB610 Monitorscope and said, "*Take that home with you, set it up as part of the station and then set all your controls, drive, microphone gain etc, as you normally run them. Then take a look at your signal and see what you find out about it.*" I followed his advice and have to admit that I reached immediately for the microphone gain control to turn it down. Having set my own house in order I then, with Don's permission, took that Monitorscope around to the shacks of about seven other amateurs in the immediate neighbourhood. After the same approach as at my house five of the seven operators became aware that they had been pushing things too hard, one was just on the limits and one was running his equipment, all home brew too, in a most conservative fashion with no signs of distortion or flat topping etc. CW operators can use such monitors to see their keyed waveforms and detect key click problems which can make them most unpopular as far as other band users are concerned. Immediately after this exercise I purchased a monitorscope and have never been without one since except on field days. Even then I miss having it with me and should rectify that situation as well.

One problem often encountered during contests is that many operators, in the heat of the moment, not only push their microphone gain up another notch but as well hit their, so called, linear amplifiers with excessive drive. Further, they are also not aware of the correct loading conditions for their amplifiers for each band. This is likely to lead to overmodulation, distortion, flat-topping and resultant splatter. It does not only happen during contests either! The use of a monitorscope helps obviate problems of this nature. First of all the operator can see at a glance or a flick of a switch when a number of these conditions exist. By using the two-tone signal source built into most monitorscopes he can tune his amplifier up for best linearity by observing the final output signal compared with the signal from the exciter and adjusting drive and loading settings for a true linear condition. In this way he not only helps himself by producing a much cleaner and thus more readable signal in the dogpiles as well as a stronger signal without power wasted in splatter but he does his fellow amateurs a favour by not subjecting them to an objectionable signal.

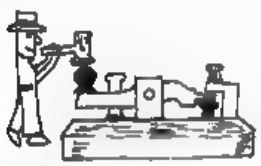
Can you now see why I believe that the installation of such monitor equipment should probably be made mandatory as was frequency determining gear, prominent in one's shack in earlier years?

The suggestions and remarks made in this article do not only apply to a station used solely for contest work but generally to any amateur radio station. The approach described should produce a station which will be a joy to operate and a source of pride and satisfaction to its owner.

I hope that these suggestions will be some help to you and inspire a little more thought about your installation to your own benefit.

Later on I will deal with some other aspects such as actual operating techniques, the mental approach and the paper work involved in a good contest station.

AR



POUNDING BRASS

Marshall Emm, VK5FN
GPO Box 389 Adelaide, SA 5001

How do you tell your best friend that he has bad breath? Worse yet how do you tell someone you've just been introduced to? As a rule you don't, so the offender goes on in blissful ignorance of the distress he's causing.

What do you do when you find yourself in contact with an operator whose CW is so poor you can barely make any sense of it? You've got his callsign because he repeated it three times, but from there on each word sounds like one gigantic character, or characters sound like all dits or all dahs or you can't tell where one word stops and the next starts. This, obviously is the CW equivalent to bad breath, and it is difficult and embarrassing to tell someone he has it.

There are a lot of poor operators on the air — unfortunately, some of them think they are terrific. Not only do we not tell them that they are poor operators, if one of them apologises for his shaky fist or says he is just learning, we go out of our way to tell them how well they are doing. Nobody will tell you if you have a sending problem, so you remain blissfully unaware of it and wonder why no-one wants to work you.

If someone did criticise your sending, you'd be embarrassed, and you'd probably hate him forevermore. *But you'd try to solve the problem, wouldn't you?*

Obviously what's wanted is a polite way of telling someone he *may* have bad breath.

The Q-Code comes to the rescue! Our spiritual forefathers, in their wisdom, assumed amateurs would like to comment on each other's sending, so they established the following Q signals (from the ARRL Handbook, 1928)

QSD? IS MY KEYING BAD?
QSD YOUR KEYING IS BAD. YOUR SIGNALS ARE UNREADABLE.
QSE? ARE MY SIGNALS DISTINCT?
QSE YOUR SIGNALS RUN TOGETHER.

That QSE code is a bit unfortunate, because the answer doesn't match the question. If QSE? means "Are my signals distinct?", then QSE should mean "Yes they are distinct", not "No they are indistinct". Well, the QSE code has vanished over the years, so it doesn't really matter. But what's happened to QSD?

QSD can be found in the RSGB "Amateur Radio Operating Manual" (c) 1979, with the following meaning.

QSD? IS MY KEYING DEFECTIVE?
QSD YOUR KEYING IS DEFECTIVE

It also appears in the ARRL "Ham Radio Operating Guide" of 1976 as:

QSD? ARE MY SIGNALS MUTILATED?
QDS YOUR SIGNALS ARE MUTILATED

By this time it should be obvious that our ability to use QSD to tell someone his sending is poor, depends upon the accepted definition of QSD. In other words, I could quite happily tell you "Your signals are mutilated", because there is some possibility of mechanical or interference problems, and it is therefore not necessarily a personal criticism. But I would find it very difficult to say "Your keying is bad — Your signals are unreadable."

There is no escaping the fact that a lot of operators *need* to be told that their keying is sub-standard. I know of one old-timer, for instance, who simply does not realise that now he's in his eighties, he can no longer send at 25 WPM, by hand. Here I think it is a case of *"what your best friends won't tell you, an acquaintance must"*.

So the original question, *"How do you tell someone his sending is poor?"* has two answers: first we must all accept a more polite meaning for QSD and use it without offence, secondly we must occasionally ask the question QSD? to invite comment on our own sending.

My thanks to local old-timer Neil VK5KQ, who suggested the topic, and also asked for comment on the use of $\overline{SK}$ meaning end of contact as compared with SK (sent as separate letters) meaning silent key. I have not yet seen any documentation on the latter usage and would appreciate comments from any readers with further information.

On an entirely different subject the following appeared in Ken McLachlan's "How's DX" column in the April edition of AR.

"Overheard KP4EQF making contact with YI1BGD on SSB. KP4EQF was elated that he had achieved a contact, which was a new country. KP4EQF also said he wanted it on CW but the YI1BGD operator said he didn't have a key. Not to be outdone he persisted and finally suggested to the YI1BGD operator that he whistle the report. KP4EQF won and departed leaving an Iraqi operator speechless. It apparently pays to be persistent.

I wonder what the payment for persistence might be? It is against the rules to use anything but speech in the SSB mode so what string in Morse Code would be either a coded transmission or, as in this case, entertainment. Also, I hope awards committees have taken note of this little interchange, because KP4EQF did not make a CW contact (the mode as distinct from the code), and has no right to claim one. Where would we be otherwise?!!

73 till next month, when we'll get back to basics.

AR

COMMUNICATIONS PRESS RELEASE

No 79/84 dated 21/8/84

DOC have announced a revised radio communications licence fee scale.

AMATEUR STATION was $19 now $21
REPEATER STATION (Amateur CBRS) was $25 now $20

COMMONWEALTH CONTEST

1984

John Tutton VK3ZC
31 Denham Street, Hawthorn, Vic 3122

Though this contest was one more year closer to the minima of Solar Cycle 21, conditions were a great improvement on 1983 reflecting in easier contacts and much more activity. Local interest soared and it was pleasing to note that 66 VKs submitted logs to the RSGB (53 in 1983) and many more were heard busy with contest exchanges. It is to be hoped that an even greater number will appear next year – just ten years ago, only seven VKs submitted logs, and six of those calls show up in this year's results.

LEADING VK

Russ Coleston VK4XA was the leading Australian for the fifth year in a row, and the sixth time in seven years, being placed third overall with a handy lead over his local opposition. From early times it would have been impossible to get any but odds-on quotes re 6Y5HN whose contest numbers given out seemed to go further and further ahead as each hour passed. He must have been working all the Canadians that we didn't even hear out here. At least 30 ZLs were heard taking part in the contest – a disappointing total of 7, one less than last year, submitted entries.

Eric Trebilcock BCRS195 with a greatly increased score repeated his win of last year in the Receiving Section.

TOP TEN PLACES

1	6Y5HN	5903	6	VE6OU	4993
2	VE3IY	5583	7	VK2BQO	4644
3	VK4XA	5391	8	VK2BPN	4206
4	G3FXB	4943	9	G3RRS	4204
5	ZL1AIZ	4840	10	VK3AEW/1	4197

RECEIVING SECTION

1	Eric Trebilcock	BCRS 195	2764

AUSTRALIAN SCORES

3	VK4XA	5391	63	VK6AJK	1870
7	VK2BQO	4644	67	VK2EL	1905
8	VK2BPN	4206	69	VK6FS	1835
10	VK3AEW/1	4197	71	VK1UD	1739
13	VK3MR	4021	72	VK3FC	1727
15	VK2AYD	3907	76	VK3DNC	1632
16	VK7BC	3863	77	VK4LT	1610
18	VK3ZC	3837	78	VK5RG	1566
22	VK3AUQ	3644	82	VK6AJ	1513
24	VK2AQF	3515	90	VK2GT	1339
25	VK6RU	3180	91	VK7GB	1309
26	VK2GW	3135	92	VK7CH	1305
30	VK3KF	3047	93	VK3YD	1290
34	VK4APZ	2883	94	VK5FG	1277
35	VK6RZ	2867	95	VK5HO	1226
36	VK3CM	2782	96	VK6AUX	1204
37	VK5AGX	2747	97	VK4BKM	1180
38	VK2ZC	2730	102	VK7TN	1075
42	VK5BN	2415	104	VK3BKU	1030
44	VK3JF	2388	107	VK4ANY	913
45	VK3YK	2352	109	VK4LV	908
48	VK6IT	2286	110	VK3CG	900
50	VK3XB	2240	112	VK5BS	769
	VK2DID	2240	115	VK2IC	696
52	VK5UM	2238	116	VK7LZ	686
53	VK4XW	2217	121	VK3MJ	610
55	VK3BDH	2180	122	VK2BHO	573
57	VK3VF	2142	123	VK3FY	532
58	VK3KS	2110	124	VK3RJ	530
59	VK3AZW	2085	128	VK3XF	460
60	VK3XU	2058	132	VK2AZR	350
61	VK2DO	2000	136	VK3SV	225
62	VK4SF	1984	138	VK7ZO	150

Single band entries among the above were:–

3.5 MHz	VK3RJ	Overseas leader
14 MHz	VK6AJK	Overseas leader, VK6AJ, VK7TN, VK3BKU, VK4ANY, VK3MJ.

PACIFIC AREA PLACES

5	ZL1AIZ	4840	41	VS6JH	2522
14	ZL2VS	3928	65	VS6BQ	1922
21	ZL1HV	3788	89	ZL3AGI	1355
28	ZL1BLJ	3075	118	ZL2BDC	693
29	P29PR	3050	126	ZL4OP	465
33	9V1TL	2932			

Team event – the ultimate entry for the four man team event would be representation from all ten areas from VK1 to VK0. Pretty difficult, admitted, but with publicity, and 'in QSO' suggestions in the month or so before the contest, not impossible. This year two VK8s were active, but no entries, while the two VK1s active and entering were short of team mates. This year's result saw New South Wales on top for the first time.

Comparative results for the last 3 years are:

	1984	1983	1982
VK2	16272	10467	13450
VK3	14549	13092	15813
VK4	12475	–	–
VK6	10333	6778	9746
VK5	8995	6922	7760
VK7	7571	5198	9865
G	17084	10872	20384

AUSTRALIAN AWARDS

The Gold Medallion for the leading VK entrant
RUSS COLESTON VK4XA

The Silver Medallions for the leading State team
KAREL NAD VK2BQO PETER NAISH VK2BPN
D A TILLEY VK2AYD E CARRUTHERS VK2AQF

The Bronze Medallion for the middle-placed VK entrant
S J FORD VK4SF

HOW THE LEADERS MADE THEIR SCORES

QSOs/BONUSES per band 80-10 (claimed)

	3.5	7	14	21	28
6Y5HN	61/10	102/34	177/57	151/42	47/25
VE3IY	29/18	121/48	143/45	165/45	12/12
VK4XA	33/21	56/30	194/64	85/45	30/27
G3FXB	35/22	60/44	111/55	69/48	10/10
ZL1AIZ	48/30	70/39	82/43	54/37	35/31

RSGB COMMENTS

Conditions proved to be better than last year resulting in a 30 percent increase in entry, in fact the largest entry for ten years or more, and an increase in the scores achieved by most entrants. A total of 28 different Commonwealth call areas are represented in the results with the VK stations taking the lion's share of the entry, almost 46 per cent. The number of UK stations submitting logs was 34 percent up on last year, with the remainder of the entry, whilst similar to previous years, also including 5N8, VP8, VP2K and a return of 9H1.

Well in excess of 18,000 QSOs were recorded in the logs, the greatest number taking place between entrants. Around 6000 QSOs were made with the UK during the 24 hours, with, as to be expected, 14 MHz carrying most traffic. Use of the bands followed the pattern, 3.5 MHz. 6.5 percent, 7 MHz. 14 percent 14 MHz. 44.5 percent, 21 MHz. 28 percent, 28 MHz. 7 per cent, and it is interesting to note that 3.5 MHz represents a mere 3 percent of the total QSOs made with UK stations.

Over 300 UK stations recorded in the logs indicate room for a substantial improvement in the UK entrants in the future. An analysis shows that 43 call areas were active at one time or another including J3, VP2M, VU, ZF, 3B8, 3D2, 4S, 7P and 8P. VE3 provided the greatest number of QSOs with the UK closely followed by VK3.

Conditions on 28 MHz made it possible for some UK stations to make transatlantic contacts, but the majority of UK activity was centred on 9J2BO, ZD3JO, VP8KF and KC7UU/5N8. The opening between VE6/7 and VK/ZL seemed remarkably good with VE6OU and VE7UZ appearing in many of the overseas logs.

For the second year running, the Senior Rose Bowl goes outside Canada despite some strong VE opposition. The winner by a clear margin is Nigel Hoyow 6Y5HN, who, entering only his second Commonwealth Contest, made a total of 528 QSOs with 168 bonuses notching up 5903 points in total. Congratulations

The Canadians remain a strong force, the Junior Rose Bowl and second place goes to Jim Roberts VE3IY, who totalled 470 QSOs with 168 bonuses to give 5583 points. VK4XA took third place.

The top UK entrant for the twelfth time in succession is Al Slater G3FXB, once again retaining the Col Thomas Rose Bowl and proving that he is still the top operator from the UK in this event. G3UKS operating G3RRS pushed G3MXJ from his usual second UK position, and made a creditable ninth position overall.

The Receiving Section attracted the same four entrants as last year and despite careful checking, the positions remain the same as 1983. The Receiving Rose Bowl goes to Eric Trebilcock BCRS195, with 'Brad' Bradbury again in second place.

No less than twenty entrants will find their final scores higher than those they claimed. Over 30 percent of the logs required re-scoring, many upwards, and in almost all cases stations lost points through unmarked duplicate contacts, transcription errors or incorrect reception of data during a contact. There were a few logs which were of a very high standard and one which, even after thorough checking, failed to provide the adjudicator's red pen a look in. Only one entrant this year tried to claim for a non-Commonwealth call area, a big improvement over 1983. Some confusion arose over ZLDAEA who was in ZL1 and ZL1AIZ who was in ZL2. Points were adjusted where mistakes in bonuses were made. The New Zealand amateur licence regulations have been subject to change recently, and it now appears that call areas are no longer restricted to zones in the country. The HFCC will be considering this issue in depth and will alter the 1985 Commonwealth rules accordingly.

Could all entrants please include details of their station as this provides useful data for the adjudicator. From the information available, the most popular single rig was the Yaesu FT101 closely followed by the TS830S and TS520S transceivers. In all, 34 different types of rigs were used including four home made stations and one HRO. Dipoles proved to be the most used LF antennas followed by long wires, with three entrants making use of large real estates and wire beams. The three element tri-band yagi was the most popular HF antenna with a number of wire dipoles being used by those with limited space, and some TH6DXXs and Quads for the lucky few. Three G5RVs were in use with 13 all band trap verticals.

MISCELLANY – super beaut contest – VK2ZC, distinct lack of activity from VE making the night on 80-40 extremely boring – G4BUO operating was at the high level of skill and quality as one expects in this world class contest – VK2BPN; outstanding activity from VK – G3MXJ. first entry, most enjoyable, will be back next year – GM3YOR; as a 70 year old, the 24 hour 'fun and games' was just my distance – VK5AGX. my first contest, much learned, much enjoyed and many thanks to all concerned – VK4APZ. missed VE7CC – VK2AQF, best contest going – VE5BAF. having let the side down last year (away in VK2), decided to see how the ground plane performed – 9H1CH.

The contest seems to be going from strength to strength, and in particular the HFCC would like to express their thanks to John Tutton VK3ZC and Eric Trebilcock BCRS195 for their invaluable help in improving the entry from 'down under'. Almost all participants expressed their enjoyment in the contest and the Contest Committee hopes this will continue.

– G4DJX

BERU 1985 1200 UTC 9 March to
1200 UTC 10 March
Rules in February AR

RESULT OF MISUSING RADIO

Operating after his licence was lifted brought a suspended sentence with a threat of prison to a Californian ex-amateur.

The former amateur, who lost his licence for jamming 40 metre operations was sentenced to a ninety day suspended sentence and three years probation.

Under the terms of his probation, he can go to jail if he even talks over another amateur's station during the probation period, unless the FCC choose to relicence him.

from Ham Radio Magazine — June 1984

Another amateur was indicted by federal grand jury on charges of using "obscene, indecent and profane language" on amateur radio. The charge carries a maximum penalty of two years in prison and a $10,000 fine.

from World Radio — July 1984

Three Californian Amateurs have been ordered to "show cause why their amateur radio licenses should not be revoked" in connection with interference to local repeaters.

The charges range from malicious interference, failing to use proper identification to broadcasting and transmitting music.

from QST – June 1984

NATIONAL EMC ADVISORY SERVICE

Tony Tregale VK3QQ
FEDERAL EMC CO-ORDINATOR
38 Wattle Drive, Watsonia, Vic 3087

AUTO – EMI/EMC

It seems these days everyone wants instant communications from everywhere to everywhere. The automobile in no exception . Not just voice communications – video, digital, computer and like systems are being squeezed into the family sedan.

With the growing interest in mobile communications, and the continuing trend by vehicle manufacturers towards all electronic control systems, it is little wonder there is conflict in our cars

This article outlines some of the problem areas, provides a few ideas on how to reduce incidental radiation (noise) and takes a look at a few of the areas of susceptibility associated with modern on-board control systems

Interference associated with older vehicles is mainly confined to noise generated by the vehicle's electrical system affecting both on-board and remote radio receiving equipment. With modern vehicles there are three basic areas of conflict, –

Noise generated by vehicle operation.
Susceptibility of the electric instruments and controls.
Unwanted signals and noise produced by these instruments and controls.

INCIDENTAL RADIATION (NOISE)

Incidental radiation is electromagnetic energy which is unnecessary to the correct operation of the device.

The automobile, by the very nature of its operation, can be a very variable and intermittent noise generator Electrical noise is wide band unwanted energy which pollutes the finite electromagnetic spectrum causing disruption to radio and electronic communications Noise energy is conveyed to the 'victim' by two basic methods –

Conduction (via the connecting cables and ground returns)
Radiation (direct or indirect)

Unfortunately it is often quite difficult to isolate completely the two modes because of the large amount of interaction.

BONDING

Shielding and filtering of unwanted energy is only as effective as the bonding. Bonding allows an easy route to common ground for unwanted energy (interference currents) Bonding also ensures the integrity of shielding and ground planes. This is most important in helping to keep noise generated by ignition and other electrical systems from travelling throughout the vehicle

Direct bonding and strap bonding should be by the shortest possible route and secured in place by sheet metal screws, or those which make very firm contact with the material. Contact material should be clean and tooth-type washers used to ensure good electrical contact. If copper braid is used for bonding, care should be taken to avoid the weave becoming corroded Corroded braid is a potential noise source. Where metal surfaces have been bared to provide good electrical contact, upon completion of the work, the area should be sealed with paint or varnish to avoid corrosion.

Some typical bonding points are –

Corners of engine to body
Exhaust pipe/s to body and engine
Bonnet (both sides) to body
Boot lid (both sides) to body
Coil and distributor to engine
Air cleaner to engine
Battery common to body and engine
Alternator and regulator to body
Bumpers (front and rear) to body (both sides)
Tail pipe to body

FILTERING

Capacitors, inductors and resistors can be used to help remove or reduce unwanted electromagnetic energy, or ensure that it remains within a confined area.

The ignition system is a major noise source. Systems in poor condition cannot tolerate much suppression. However, contrary to popular conception, suppression has no degrading effect on an engine which is in good condition. Therefore it is most important that before any attempt is made to investigate interference problems, the whole vehicle should be checked by a professional motor mechanic using electronic engine analysis equipment.

Noise created by the HT side of the ignition is of high frequency, sharp and spiky Regular resistive HT cable is the most common method of reducing these sharp transients. There are a number of elements which can be used to improve suppression at VHF, and above Inductively wound HT cable is very effective. Additional VHF suppression can be obtained by fitting distributor "tower" suppressors (angled types are available) and special suppressed plugs

To avoid ignition interference currents being fed to the rest of the vehicle by the conduction method, the DC supply to the coil should be made via a 0.1 μF coaxial capacitor and a toroidal choke, both mounted close to the coil. The 'SW' connection (to distributor points) should be fitted with a 0 005 μF ceramic disc capacitor, returned (and soldered) to the coil mounting bracket.

Rotor arms and distributor caps should be replaced every 20,000 km. After a long period of service, the distributor cap material becomes a semiconductor, causing intermittent leakage current.

Other electrical equipment such as the alternator, wiper motor, voltage regulator etc, can be filtered by regular LC filter networks, consisting of, for example, 0.5 μF coaxial capacitors and toroidal chokes

SHIELDING

The ignition system can be fully screened. Ignition leads can be fitted with close weave copper braid. The distributor can be fully enclosed in a (tin-plate) can with provision for the lead shields to be bonded. The coil can have, at least, the top half screened, and the input and output leads screened and bonded. Leads to other equipment should be screened as necessary

SUSCEPTIBILITY

The tendency in modern vehicles is to use solid state devices to monitor and control various systems Unless special precautions are taken, these devices can react to electromagnetic energy Most vehicle manufacturers, unlike domestic electronic manufacturers, take special care to protect their on-board electronic systems. However, there are still some areas which can react adversely to EM energy from on-board communications equipment

The most vulnerable part of the modern vehicle's electronic control system is the central computer and electronic fuel injection. The indicators and fuel gauge are also very vulnerable. There are many other sensors which should be kept in mind if the vehicle is to be subjected to electromagnetic energy; some of these are

wheel slip control, anti-lock breaking system, automatic self levelling system, automatic cruise control, automatic lean burn system, the trip computer and others.

Recent reports refer to EM energy affecting the EFI system causing the engine to run intermittently or stop altogether Traffic indicators and fuel gauges have also been problem areas.

Most susceptibility problems with modern electronic control and monitor systems can be solved, in the first instance by referring the problem to the vehicle manufacturer We do however feel that in some cases the basic design of the vehicle electronics could be improved to afford higher order immunity to unwanted energy, thereby reducing the need for so much add-on suppression and the careful positioning of equipment in order to avoid interference problems

Members of the Amateur Radio Service should investigate the vehicles total EMC before installing additional electronic and/or communications equipment in a vehicle which has any form of electronic or computer control. Furthermore, a full series of tests should be completed after installation of communications or other additional electronic equipment prior to taking the vehicle on the road On the road, proceed with caution until you are satisfied there are no ill effects from the additional on-board equipment

AR

"PRESS POINTS FINGER AT BROADCASTERS"

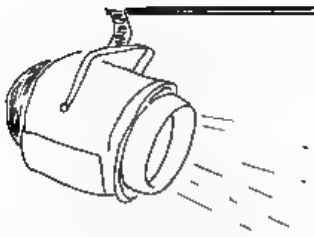
Newspaper reports in three states inferred Broadcasting Stations were responsible for interference problems with Video Cassette Recorders.

The Broadcasting Service, the Business Radio Service, the Amateur Radio Service and other responsible users of our finite electromagnetic spectrum cannot be held responsible for the interference problems of VCR's and other domestic electronics, and electronics entertainment products which have a high susceptibility to unwanted electromagnetic energy

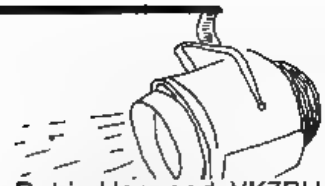
The National EMC Advisory Service responded with a press release designed to set the record straight and place the responsibility right where it belongs – on the manufacturers of the domestic products.

Our press release found its way to most media outlets around the country This resulted in a telephone-on-air interview with Adelaide Radio Station 5DG, and a telephone interview with the Public Relations Department of the Australian Consumers Association

AR



SPOTLIGHT ON SWLing



Robin Harwood, VK7RH
5 Helen Street, Launceston, Tas 7250

Well, we are into the tenth month of the year and how quickly it has passed. In many respects, it has been a quiet year with no extraordinary propagation, particularly on the higher frequencies, although lower down in the tropical bands we have noticed some interesting signals. With spring now upon us, there should be some improvement in HF propagation, as the amount of atmospheric noise increases on the lower bands to the point of being unusable, particularly in the early evening hours.

INTERESTING SIGNALS

I have not been giving much attention to eavesdropping across the various frequencies lately, due to other pressing committments crowding in to my time. So I have mainly relied on information from regular programming to keep abreast with the latest developments around the spectrum. Two interesting signals on the 60 metre tropical band I did note were Radio Tachira in San Cristobal, Venezuela on 4.830 MHz and a Soviet "Mayak" relay on 4.765 MHz. The Venezuelan was observed as early as 0630 UTC in Spanish with frequent I/D's and plenty of typical Latin music. According to the current World Radio TV Handbook, its transmitter is only rated at one kilowatt. It puts in quite a reasonable signal here in Northern Tasmania, until other Latin American signals appear and swamp it. The station now must operate 24 hours!

LIGHTHOUSE NETWORK

The second station on 4.765 MHz around 0630 UTC onwards is carrying the Soviet 'Mayak" of Lighthouse Network. This continuous light programme is heard on a variety of frequencies around the clock, mainly from USSR sites. However, the signal on 4.765 MHz is a relay in Cuba. It perhaps is for Soviet personnel in that country and in Nicaragua. The signal is quite strong, indicative of high power, in an allocation where the majority of Latin broadcasters are utilizing rather modest levels. You may remember that Radio Moscow utilizes super-powerful MW senders in Cuba to broadcast to the south-eastern part of the US and the Caribbean. Under this arrangement, Soviet senders relay programming for R Havana to Europe and Africa.

DX PROGRAMME

It was announced at the ANARC Convention, recently held in Toronto, Canada, that the Voice of America was to commence a DX programme as from the 13th of September. Naturally, I don't have the broadcast times available when writing, but it would be worth your while checking programmes from the "Voice" in Washington DC. I seemingly recall that 20 years ago, the VOA had a monthly programme for amateur radio operators hosted by George Jacobs. It lapsed after six months or so, probably because of the limited interest in the hobby at that time, coupled with the fact that US residents within the USA could not participate or contribute in the "Voice's" activities. This has now changed and together with the dramatic upsurge in interest in electronics world-wide, the station once again will be trying to see how this will work.

The VOA has been switching its emphasis in programming to a news and information format, dropping shows such as the "Breakfast Show". Other music programmes are being cut back also. Coupled with the recent announcement that the various relay bases throughout the world will be upgraded technically over the next few years, it seems that the "Voice" is making determined efforts to increase their signal and [redacted].

BETTER RECEPTION?

Radio Australia's Relay Base in Darwin, which was flattened in Cyclone Tracy, just 10 years ago, is operational after being silent. Listeners in SE Asia and the Pacific can expect an improvement in signal level. This will, hopefully, permit the Shepparton transmitters to beam to Europe and North America, areas which have missed out on RA's signals recently. Also an additional transmitter at Carnarvon (WA) will, as well, improve audibility in the Indian Ocean and East Asia.

Another relay station in Sri Lanka should be shortly operational. It will broadcast programmes from Deutsche Welle in Cologne, West Germany. This could make it much easier for enthusiasts to verify Ceylon, as this was the title most of us can remember. Up till now, only "Radio Monitors International" a DX programme produced by Adventist World Radio – Asia and aired over SLBC in Colombo, was the only way to obtain a QSL.

ALTERATIONS

I have noticed in the September issue of 'London Calling", which is the monthly magazine of the BBC World Service, that there were going to be changes in some major programmes and alteration to frequencies on the 29th and 30th of September. Details will be found in the October issue but I don't have details of what these will be. However, there is a programme reviewing highlights of the forthcoming week's highlights, appropriately titled "In the Mean Time" at 1115 UTC and if you listened on Friday 28th September or the 5th of October, you will be able to keep abreast of the forthcoming programme changes. Frequency alterations will be heard over "Waveguide" on either Monday 1st October at 0915 or on Wednesday the 3rd at 0430 UTC.

As a recent experiment, two of Australia's DX clubs combined to produce a joint magazine, to cut down on duplication. After four joint issues, the two organizations have decided to go their own separate ways and preserving their separate identities and interests. It is a little disappointing but understandable that this has not become permanent. The two do have different emphasis on the hobby and besides are in different geographical areas, which made it hard to co-operate.

[redacted]

This month sees the annual Jamboree on the Air operational on the 21st and 22nd of October. As in previous years, I will be operating with the 18th Launceston Sea Scouts from their HQ right on the River Tamar. We will be operational on most of the HF amateur bands as well as doing some shortwave monitoring. If you hear VK7RH/P, please give us a call.

Well, that is all for this month. Until next time, the best of 73 and good DXing! – Robin. AR

INTRUDER WATCH

Bill Martin, VK2EBM
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Speaking personally, the effects of the solar cycle sinking slowly in the west are certainly being felt in this shack, with DX becoming more rare every day. It's not so much a case of working rare DX now, but just about any DX at all is very welcome.

Things must be tough, because even some of the regular intruder stations are suffering loss of signal. UMS on 14.141 MHz (Australian winter) and 21.032 MHz (Australian summer) is being heard down to S 2's and 3 s, where, a few months ago, he was regularly S9. *But he's still there.*

New from the USA comes the information that the infamous intruder 'F9T', who operates CW on 21.115 MHz has been located by the FCC, using their monitoring station in Arizona, and he is in Tibet, just a little East of Lhasa.

Two (apparently) regular intruders have popped up on 20 metres, 14.203 and 14.211 MHz respectively, and their mode designation is M7B, for those who wish to report same. The signals sound like R7B, but information from New Zealand confirms it as being in fact M7B, which is phase-modulated pulse.

Reports were a little down for July last, but I suspect the cold weather may have been a contributing factor. The 'Voice of the Malaysian Democracy' has been heard on 7.067-7.071 MHz by Robin VK7RH. The usual 40 metre broadcast stations are still in evidence, and jamming signals are still causing a nuisance.

Messrs G H A Bradford of Katoomba, NSW, and P Boskos of Kulnura, NSW, are two of the SWLs giving good support to the IW. The IW is a good way of gaining experience on the bands for those working towards an amateur licence.

Plans are now well under way to try and put a crimp in the operations of the USSR Naval intruder, 'UMS', (mentioned above), who has been active for some years, and it's about time our displeasure was registered with the USSR in no uncertain fashion. We'll see what comes of that.

Reports for July included those from VK2BQS, VK2DUO, VK2QL, VK3AMD, VK3XB, VK4AFA, VK4AKX, VK4BG, VK4BHJ, VK4BTW, VK4KHZ, VK5AOZ, VK5BJF, VK5GZ, and VK7RH. Many thanks to those amateurs for their support of the IW and we look forward to continuing support from them, and welcome reports from others who may have contributed previously, or who may wish to get started in intruder watching, and help out amateurs around the world.

Information regarding the Divisional Co-ordinators may be obtained from your local division of the WIA, or from myself, at the address shown at the top of the column.

Please try and help, and see you next month.

AR

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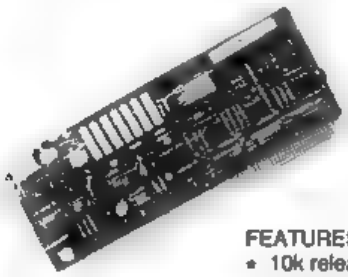

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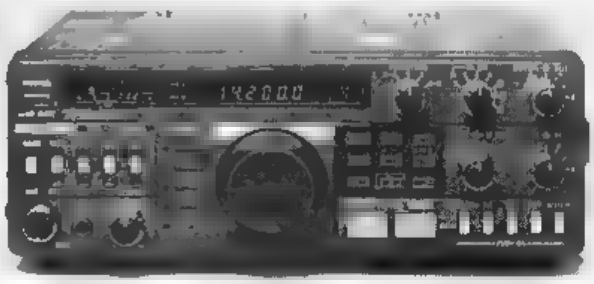

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VK2 MINI BULLETIN

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
PO Box 1066, Parramatta, NSW 2150

As most readers are aware, next year is the Institute's 75th Anniversary. The records available to us indicate that a meeting held in Sydney during March 1910 was the foundation of the WIA. A subsequent meeting in Melbourne in December 1910 saw the Victorian end commence. Other states followed at later intervals. The NSW Division is planning to commemorate the foundation during the early part of 1985.

Preserving history is important. Each amateur no doubt has or knows something which is of historical significance. How about putting pen to paper with a brief description of it and sent it to our Historians, c/- PO Box 1066, Parramatta NSW 2150. (Other states should do likewise and send to their local Division.) We would like these notes by 30 November 1984. For example, *Did you use spark?, When did you first use VHF on 56 and/or 112 MHz?, Early emergency operations?; First use SSB?, etc.* It does not matter if you are a recently licensed amateur, for one day even your present day activities become historic. Maybe you had some relatives who were early amateurs, and you have details on them. At this stage all we need are brief notes on the subjects so that something can be put on file for follow up later.

The next Conference of Clubs is to be held at Bathurst, on Sunday 2nd November. The Cruising Yacht Club ARC was recently affiliated with the Division. An application from the Manly Warringah ARC for a UHF repeater service for Terry Hills is being processed. Applications from Bathurst and Orange ARC's for UHF repeaters are currently being assessed. Two sections of the Divisions Correspondence Course notes have been reprinted in an offset A4 format. A high demand for the course continues, particularly for the Novice to Full Call series. The recorded Morse tapes from the Education Service section have been remade and the new [illegible].

The Education Service accounts for the year ending 31st December, 1983 have now been audited and copies of these are available to any member who may be interested. Trading results for 1983 show that there has been a small increase in sales over last year resulting in a substantial increase in net profit. This years profit amounted to $3572 compared with $1577 in 1982. The assets of the Education Service are shown as $39,025 which includes Stock, Equipment and $22,951 Cash and Interest Bearing Deposits.

For WICEN, October is to be another busy exercise month. The Batemans Bay car rally deferred by rain in July is to be held on Saturday the 6th. The following weekend 13/14 is the Outward Bound Hawkesbury Canoe Classic. Further details via nets and broadcasts.

Don't forget to provide sufficient notice of coming events. The long weekend at the start of October is the South West Zone Convention, this year at Young. Details from Peter VK2APP.

FIVE-EIGHTH WAVE

Jennifer Warrington, VK5ANW
59 Albert Street, Clarence Gardens SA 5039

It may seem a little early to be thinking about what we will be doing in 1986, but at Divisional Council meetings and other meetings, over the past couple of months, that is exactly what we have been discussing. 1986 will be our 150th Jubilee year in SA and we are looking forward to a big participation on the part of the amateur fraternity.

We started by co-opting on to Council Graham Hortin-Smith VK5AQZ who had been trying to get us motivated for some time! We then formed a sub-committee of Graham, myself, Rowland VK5OU, and David VK5AMK. Since then we have co-opted another group of people who will each be in charge of a certain mode or technical aspect (ie RRTY, CW, ATV, Satellites etc).

These people have been asked to co-opt their own group of helpers . the idea being that not only will this take the burden off a few, but everyone gets a chance to be part of "the action".

AND WHAT ARE WE PLANNING?

Well, at the time of writing we are lobbying at top Governmental, even Ministerial levels for finance, the bulk of which will be for QSL cards and awards to promote SA in 1985 — so that more people will be aware of Jubilee 150 in 1986 and come to visit. As well as the cards etc we are planning to be seen, and heard, at many of the major venues, and as a 'Curtain raiser' our speaker at the Christmas meeting this year will be Mr Ray Woods from the Jubilee 150 Board. He will be telling us what they have planned for 1986, and if there is anything that Graham hasn't already thought of (which I doubt!) how we can become involved. Graham's enthusiasm is infectious and I hope that by the end of this year or at least by March 1985 when J150 is launched, every amateur in VK5 will have been bitten by the bug and eager to tell everyone he works on air what J150 is all about.

DIARY DATES

23rd October — Des Clift VK5ZO, will speak on "Microwaves"
30th October — Buy and Sell.
WOT — NO PROGRAMME ORGANISER (STILL) !!

AL

AMATEUR RADIO EYEBALL GROUP

A popular social event takes place in Melbourne twice a year when the Amateur Radio Eyeball Group gathers.

The mid-week meetings in May and November have been organised by the group's social director, Bill Griffiths VK3DWG. The group began when someone thought those who were on-air friends would like to meet each other.

"*The meetings are now so popular and successful they're here to stay,*" said Bill.

He quickly explained that all radio amateurs are most welcome to attend the "pay for yourself lunch and drinks" session of the Eyeball Group.

In the tradition of the eyeball QSO, those who attend enjoy meeting the people behind the voices.

The group meets at the Old England Hotel in suburban Heidelberg — advance publicity is put over the VK3BWI Sunday Broadcast or inquiries can be made direct to Bill VK3DWG.

AL

L-R: John VK3XEJ, Bert VK3BH and Fred [illegible]

From left are Em VK3CEW, Les VK3BLR, Rick VK3CHF, John VK3DKD and Aussie VK3BZR.

Rick VK3DEY and Aussie VK3BZR enjoy the recent Eyeball Group gathering.

CLUB CORNER

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

WINNIE THE WAR WINNER

Reading Amateur Radio August 84, about Winnie the War Winner, takes me back to the 40s when I was an Aeradio Operator with the Department of Civil Aviation temporary stationed at Daley Waters NT. It was a 24 hour station guarding 3 and 6 MHz mobile frequencies, our group of six were fairly busy, all communications mainly on the key and using Syko codes.

All aircraft heading north from the south and west came via Daly and we had many busy periods. The station originally comprised the usual bits and pieces, Belloni, Tost, DF and DME amongst those being available. The original unit was located in the hangar, which had a dirt floor, a Heath-Robinson sort of arrangement, however these conditions were improved when we moved into a reasonable building nearby. General sleeping quarters were mostly tents and at nights we used to amuse ourselves talking via whistling Morse and trying to overcome the bu. frogs.

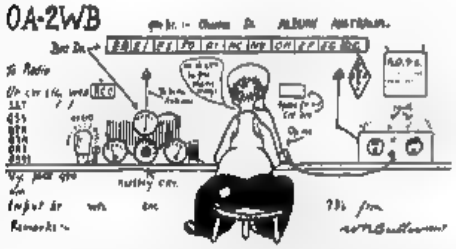
Back in Timor I had, on a couple of occasions, to be in contact with a station who had messages for relay to Darwin, another Eric Green, an ex PMG Telegraphist, was a skilled CW man and also took a number of messages. The last I heard of Eric he was located in the tape room at Brisbane Tape Centre. Another at Daly at the time was Wal Dempsey who I believe is an active amateur in VK3. Perhaps this tit-bit of information might help to fill in a little of the jig-saw of information about this episode.

J Brinkman VK2IS
61 Gundagai Street,
Coffs Harbour, NSW 2450

AR

VINTAGE QSL

The enclosed 'vintage' QSL Card may be of some interest. 2WB was my original call in 1925 — now VK2BC.



With only 5 watts, a single tube Hartley and a 2 valve Reinartz I worked some 15 countries before I passed the PMG Morse examination for Postal Clerk. I was sent relieving in Post offices in the Riverina and experienced difficulties with boarding house power supplies of 200V DC etc causing me to eventually relinquish my call. Resuming amateur operations after WW2, I found 2WB had been re-allotted and was given VK2BC.

The original card was drawn up by me 1 x 1 size, being unaware, as a country boy, that I should have drawn it much larger.

One 12 metre mast erected by my late father in 1922 is still standing at Albury.

I am still active, chasing any new country, having a total of over 300 confirmed.

Yours faithfully,
Bill Bullivant VK2BC
43 Astrolabe Road,
Kingsford, NSW 2032

AR

INFORMATION

At the bottom of the middle column, page 24 of the June issue of Amateur Radio is an Antique Card from A2HM, who, most likely, is now a silent key.

Alex Marshall sent me a duplicate QSL card in 1926, when I was only a SWL, and had just returned to Australia from Russia after an extended tour as a marine engineer.

Years before that Alex had married a Muriel Scorgie, a step-sister of my mother, and they had a daughter "Dinny" who had a YL licence.

The reproduction of Alex's card in the June issue made me realise that, with all my wanderings in RAAF and up at Woomera until my retirement in 1966, I had lost contact with the members of that side of my family, and I wonder if any of the "Old Timers" could help with information?

For information, I was born in Port Pirie in 1901, schooled at primary and high schools, and served an apprenticeship in Fitting and Turning, became a member of Australian Institute of Marine and Power Engineers, and served as Fourth Engineer on SS "Queen Margaret".

With two other chaps (now deceased) I got a licence to form Midlands Broadcasting Service as Station 5PI which we eventually sold to the Advertiser Network, and I was Sunday Op/announcer until the big 5PI was established at Crystal Brook. My OLCP (Telephony) No. 200 was issued on 10 January, 1935, and I passed the Limited in 1964 at Woomera.

With best wishes.
Yours faithfully,
Colin Bottrall VK5ZNB
136 The Terrace,
Port Pirie, SA 5540

AR

RE "POSSUM POWER"

I refer to "Possum Power" by Allan Doble VK3AMD (Letters-August 1984). Those living in areas where possums are scarce or non-existent can help themselves with a device due to Drew Diamond VK3XU and published in "AR", October 1976 – page 9.

This device will do all that is claimed for it and is easy to make and use.

One has been in service at this address for seven months and has been, and still is, very worthwhile.

Yours faithfully,

Allan Bull VK2FB,
67 Funlugh Road,
Wagga. NSW. 2650.

AR.

"FINE POMMY BROTHER"

May I extend through your columns my thanks to VK4RK for his hospitality when I came over to Queensland in May/June this year and also thank all those stations who made me so welcome as VK4FPB.

During my stay I managed to work about twenty-seven countries and talk back to friends in G-land using Ken's excellent station at Rockhampton.

I hope to keep in touch with all VK friends, new and old, propagation permitting, although "G4NJH" has less of a ring to it than "Fine Pommy Brother" (and variants thereof) which caused some amusement — and questioning of the new "F" calls by some – in Aussie. Thanks again.

73
Jeremy Boot G4NJH/VK4FPB,
7 Harrow Road,
Wollaton Park
Nottingham, NG8 1FG

AR

PUT THE FUN BACK!!

In this household the RD Contest has almost become as popular as a religious festival. Every year there are rituals to perform, shack clearing, junk-food meals, (so that Mother can operate instead of cook') and friendly rivalry between the OM and myself sharing the operating bench.

But this year our hearts just weren't in it, and it was obvious by the number of callsigns on two metres, that were missing, that we weren't the only ones. Imagine being a 'Z' call (as I was a few years back) with only a couple of channels on 2 metres, and 53 1MHz. I would have given up my RD participation long since if I had had to wait for six hours between contacts. I can't really understand the argument that it makes it fairer for the country members, surely what we want is more points from whatever source. I bet there is a 'Z' ca. in some little country town who would have enjoyed it much more if he could have worked the other six amateurs in town once every hour instead of every six!

So, come on all you country members, tell me I'm wrong (or right?). But please Mr Contest Manager, next year can we have our VHF contacts every hour, and put the FUN back into the RD.

73/88
Jennifer Warrington — VK5ANW,
59 Albert Street,
Clarence Gardens, SA, 5039.

AR.

Captain Ian H. Shepherd
Hutts Farm
Blagrove Lane Wokingham
Berkshire England

As part of my duties as a 747 Captain, I have been directed to live in Sydney from 5th November this year till 2nd February 1985.

As a keen Dx'er with a great interest in HF operation it is my intention to bring to Australia sufficient equipment to set up my own station as VK6GX/2.

I would be most interested to hear from any fellow amateurs in the Sydney area who might be able to suggest or help with accommodation that I could rent during this period. I shall be on my own except for three weeks around Christmas when my wife and twelve year old son will fly out to join me.

I look forward to being on the other end of the 'long path'.

73 Ian Shepherd, G4LJF
Hutts Farm,
Blagrove Lane,
Wokingham,
Berkshire,
England,
RG11 4AX

AR

LOCOMOTIVE MOBILE??

I read Joe Baker's column in the August issue and would like someone to clarify some points for me, regarding the 2 metre operation from the train

Was the conductor right in saying "You can't do that there 'ere"? Assuming that Joe was producing only 2 metre radiation, was he within his rights to operate on the train?

What frequency should the train radio be on?

As a last piece of curiosity was Joe "Locomotive" (lm)mobile or what

Elizabeth Dodd, VK4YIA,
PO Box 244,
Cloncurry, Qld. 4824.

The Editor Replies

1 The conductor was right, if interference was experienced. Train safety would take priority over non-urgent communication.

2 Until otherwise instructed by a responsible officer (the conductor) Joe was within his rights.

3 Probably the land mobile band 156-174 MHz, with the risk of image response to 146MHz.

4 Not unless he was on the locomotive!

AR

HALLEY'S COMET

At the last Council meeting of the WA Division of the Wireless Institute of Australia I was asked to head up a sub-committee to organise and co-ordinate research and other projects relating to the effects on radio communications by the presence of Halley's comet.

I am interested in contacting anyone who may have the same objectives, in order to swap and/or pool information. To date I have data relating to dates, distances, azimuth bearings etc.

The broad objectives of the sub-committee are to work in with the radio-physics departments of the various government and autonomous tertiary establishments to make observations on propagation, compile data and correlate our conclusions with those bodies. Our findings will be recorded and made available to the Institute for publication.

This approach of the comet towards earth favours the southern hemisphere, thus placing us in "the box seat" for this once in a life-time opportunity to leave some data on record for future radio enthusiasts. It will be visible to the naked eye about December 1985 and it is anticipated that our research will begin before then, so an early indication of involvement would be appreciated by contacting: *The Comet Sub-committee, GPO Box 10, West Perth, WA 6005*

Yours sincerely
C D Rice VK6MY,
19 Pinjarra Road,
Murray Bend, WA 6208.

AR

MURPHY AGAIN

I would like to point out an error in my article, "Dupe Sheet for the RD Contest", reprinted in the July 1984 edition of AR.

The error occurs in Figure 2, on page 41 of AR. The letter 'A' at the top of the drawing, should be letter 'B', as per the article

Using this dupe sheet method for the 1983 RD, I made 374 contacts. Two contacts were VK4's, thus non-scoring, whilst two duplications were made late in the contest These dupes were discovered within 30 seconds, however numbers had been exchanged. At least they were promptly marked as dupes on the log sheets. Quite a few other stations were discovered as dupes whilst the contact was taking place, thus enabling the contact to be cancelled

I use the system as a one person operation, whereas if one person looked after the duplication sheet, it does take some strain off the operator of the station.

Regards,
John Moulder VK4YX,
PO Box 323,
Warwick, Qld, 4370

AR

RE-HIGHER POWER

Ted VK4YG, re your letter August 84, please reread my letter of June 84. The two examples of propagation were (1) *14MHz while I was in contact with a US station and (2) the 1.8 to 10MHz bands during sunspot minima.*

You will note propagation exists in both examples and the higher power can make the difference in bridging the gap from barely detectable to readable.

Other feedback I received included the fact that US Novice Licencees are permitted 200 watts output.

I suggest added privileges as incentives such as CW, SSB output power levels for Novice to be 10 watts, 30 watts (unchanged), Restricted (limited) 120 watts, 400 watts (with the current provision for issuing a high power permit remaining unchanged) and Unrestricted (AOCP) 1000 watts, 1500 watts. The latter is identical to that in the USA and is within the scope of amateur home construction (see amateur handbooks). Commercial equipment of this power (Yaesu, Kenwood, Alpha, Drake) has long been available in the market place and the amateur's shack here in Australia.

Yours faithfully,
Sam Voron VK2BVS,
2 Griffith Avenue,
Roseville, NSW, 2069

AR

THIRD PARTY NETS

Whilst I appreciate the work done by the Third Party Nets, Sam Voron VK2BVS, June 1984, I cannot agree with the suggestion for up to a Kilowatt output power Although he suggests that it be allowed to all AOCP operators for use in emergencies. How do we police it?

Amateur licences are issued for experimental purposes. I consider the present maximum of 400 watts PEP is adequate for that purpose.

There are several amateurs within a radius of three kilometres of my QTH. Their SSB signals appear to be 10 to 15 kHz wide. Imagine the QRM if we were all allowed to use a Kilowatt. I suggest that only one at a time could use SSB on one band.

Could I suggest the use of CW in the Third Party Nets, even though it may take a little longer to transmit a message. If CW were used Mr Voron's problem may be largely overcome. I find it much easier to copy CW than SSB under poor band conditions.

Yours faithfully,
[redacted] VK6AAM,
14 Thurlowe Avenue,
Yokine, WA, 6060

AR

AUSTRALIAN TRAFFIC NET

Ted VK4YG, re your letter August 84. WICEN uses a particular format because it must be able to communicate with SES, Police and other services

The ATN does not handle traffic with SES, Police etc so has little need of that particular format But the ATN does handle daily International Third Party Traffic with the USA and Canada and soon with over thirty other countries with whom Australia is seeking International Third Party Traffic Agreements. All these countries use the ARRL format adopted by the ATN

Sure ATN and WICEN have similarities but they are not the same. WICEN is a core of reliable, trained, tight knit operators. When NSW Police want WICEN ready with operators and equipment, portable, base, mobile within six hours in the middle of the state during a working week WICEN must be able to respond in a way only it and no other amateur radio group can. In NSW our Police know WICEN'S capability, its dependability and that's why it is used.

ATN is different, being more an "on air" team rather than a "face to face" team of people. We handle only amateur to amateur and amateur to general public third party messages by means of daily on air schedules at 0245 UTC-21 160 MHz, 1030 UTC-3.570MHz and 1100 UTC-14.303 MHz.

In emergencies, for our 15,000 average amateurs unfamiliar with formats, the regulations book covers what to do. All are expected to summon help or give assistance. ATN and WICEN are different from the average licencee in that they use message formats to link into other networks.

The different WICEN and ATN formats simply reflect the systems they service.

In the last two Simulated Emergency Tests (SET) both groups have operated side by side with no problem. Mutual assistance when needed and regular consultation has prevailed both during the 1982, 1983 SET and the Australia wide 1981 STD telephone break down where urgent messages between authorities were handled by WICEN and between the general public by ATN.

Because Queensland has never participated in the SET I would suggest you contact NSW WICEN and learn about the benefits gained from such joint exercises.

During SET WICEN use the ARRL formats on the International Assistance and Traffic Network for its international communications with bodies such as the US relief agencies, Canadian Red Cross etc Overseas replies are converted by WICEN to their own format before relaying. Thus SET has given WICEN operators an international message capability and fluency in two formats

The ATN manual for operators includes details on the WICEN format. Indeed there has been a great deal of interaction between the ATN and WICEN in some states.

Yours faithfully,
Sam Voron VK2BVS,
Co-ordinator ATN,
2 Griffith Avenue,
Roseville, NSW, 2069

AR

INVITATION TO ATN

ATN is a public service net. 99.9% of traffic is routine greetings.

ARRL texts assist passing overload traffic efficiently Once messages reach local areas, texts are telephoned to addressees. *For example "GAMES TWO X ARL FORTY SIX" means "I arrived safely and am having a wonderful time here at the Olympics. I look forward to telling you all about it when I return. Greetings on your birthday and best wishes for many more to come."*

Since last September, I have improved my traffic handling skills. ARRL texts are obtainable. Please send a 30¢ stamped self-addressed envelope.

Stations are welcome on 3.570MHz±QRM at 1030 UTC daily

VK3KPR

Yours faithfully,
Ken Richards VK3KPR,
Victorian Representative, ATN,
2/15 Neilson Street,
Bayswater, Vic, 3153

AR

THE ATN EXISTS

I see Ted Gabriel VK4YG, has written another letter attacking the Australian Traffic Net; (Aug AR) written in the same inflammatory style as his first

Sam Voron VK2BVS, receives similar treatment in the first section of Gabriel's letter VK4YG obviously never operates under conditions of marginal copy

That first letter from VK4YG was answered by three ATN members, including myself none of whom used the derisive insulting style of Ted Gabriel. Nevertheless, they received more of the same in his reply

On just how high a pedestal does Ted Gabriel think he stands, that he can write on the opinions of others with such arrogance and scorn? He displays a closed mind, a tendency to sarcasm and an abhorrent "holier than thou" attitude totally alien to the amateur spirit. He dismisses Bill Main's reasoned comments with an air of intolerable superiority

He says I denigrate the DX capabilities of many experienced amateurs by my statement that the demonstrated international capabilities (of WICEN) are only similar to the ATN's. The key word there is "demonstrated", referring to WICEN as a body taking part in an organised exercise. I would have hoped no one could read anything nasty into that statement.

He repeats his assertion that the ARRL format is not internationally recognised Perhaps he believes if his assertion is repeated often enough, some people will believe it, for he offers no substantiation Bill Main and I say it is, and we have both operated tens of hours on a major amateur third party net devoted entirely to passing international messages, the IATN

What format is used by other emergency services is relevant to the general subject but not to the immediate point.

True, the ATN cannot guarantee to deliver traffic, but a little objective thinking shows why international traffic; destinations over the whole of Australia, the youth of the ATN. I wonder how close to its aims WICEN was after only four years of existence?

Ted's suggestion that the ATN use WICEN format internally, and ARRL format for overseas traffic is worthy of consideration by the ATN. This was, in fact, done by VK2 WICEN in SET '83.

The conciliatory tone of the above suggestion was completely negated by the last paragraph, in which he rose to the heights of arrogance by saying, in effect, that if the ATN fails to recognise his version of logic it will be condemned to a lonely and foolish existence.

The ATN exists in its own right and, with more participation, with flourish. The format and procedure it uses will be governed by the circumstances under which it finds itself operating, not by the thoughts of Chairman Gabriel.

73

David Bell, VK2BDT.
7 Rugby Close,
Wyoming.
Gosford. NSW, 2250.

This letter has been edited. Unless more meaning and less emotion is forthcoming on this topic it will be necessary to terminate the discussion. Ed.

AE

HAPPY MOTORING IN VK LAND

In the city of Athens, on top of a hill, stands a citadel, the Acropolis, which was the seat of learning in ancient Greece.

In Greek history we read of their drinking, victories and captives. They were good at other things like making spirits, one in particular called methu. This was distilled from wood. It was a colourless volatile liquid, neat alcohol, a mind-bender for sure. The greek soldier who ran 40 kilometres to tell of a great victory then fell dead. they say he was fuelled by methu!

Today we still use that ancient drink. We call it methylated spirit. Mind you, it has been treated to stop one having that sly nip, but it still comes from wood. Modern man in his wisdom mixes it with chemical liquids to render it unfit for drinking and therefore exempt from Customs and Excise Duty.

What has all this to do with motoring in VK land? *Plenty.* Picture the outback hotel/garage/general store. Standing alone in the blazing sun, a petrol pump. One turns the handle at the side to pump petrol into the glass jar that sits on top. *Remember those?* They still use them in the outback. Refuelled, one continues. After about an hour the car starts to have a fit! The engine has sensed water in the fuel. This is called "Kangaroo Juice". How to stop it?

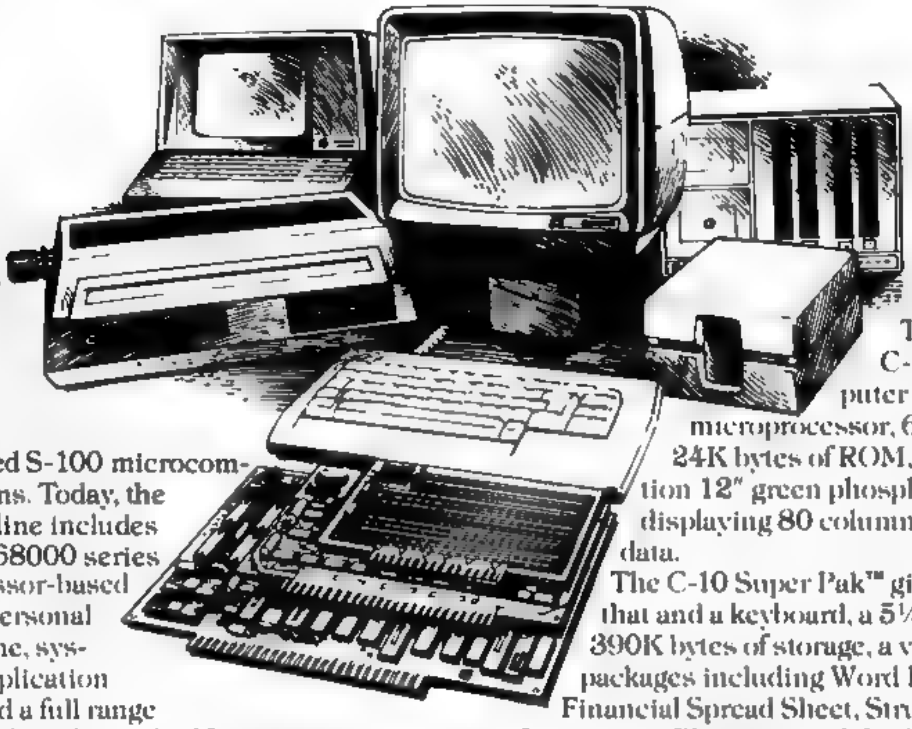
On your next trip take a one litre bottle of methylated spirit. After you fill with petrol, just before replacing the cap put a cup of methylated spirit into your tank. This will dewater your fuel system and keep the engine running smoothly. Also, it will start more quickly without choke, even on the coldest of mornings. A cup of methylated spirit every time you fill it with petrol. Even your local petrol station cannot stop water going into your tank, because some water is in their bulk tanks underground.

Carry a bottle in the car. It has other uses, such as spirit stoves, starting BBQ's etc. Useful for drying auto hydraulic, electrical systems and components, as well as fuel systems. My 1974 Datsun 120Y automatic has been to Geraldton and to Albany, on each trip with a quarter of a tank of fuel left after filling up in Perth. On its second time around the speedo, the engine has not had the head lifted yet and is still good for another 100,000 kilometres, all thanks to that Greek juice that they called methu! It is good for tired and aching feet, joints etc, if you put 25% in water. Happy motoring!

Brian L. Hughes L60099,
60 Redcliffe Street,
East Cannington WA 6107

AE

Cromemco® has it all from build-ins to hands-on. And Insystems has all of *Cromemco*®



Since 1975, Cromemco has been an industry pioneer in advanced, sophisticated S-100 microcomputer systems. Today, the Cromemco line includes Z-80A and 68000 series microprocessor-based systems, a personal computer line, systems and application software, and a full range of board-level products. And Insystems carries them all

This wide range of systems, software, and components lets you choose the hardware/software combination best suited for you. Consider their board-level products, for instance.

Cromemco offers a wide variety of board-level system components, including CPUs, memory cards, graphics and I/O cards. These boards are fully integrated with each other and with Cromemco systems to assure reliability. With these S-100 bus cards, systems can be easily configured for specific applications in almost any professional, industrial, or business field.

In addition, Cromemco offers a complete line of support system components, such as card cages, power supplies, extender cards, and system connector cables for individual or OEM system requirements.

A good reason to buy a personal computer.

The Cromemco C-10 personal computer includes a Z-80A microprocessor, 64K bytes of RAM, 24K bytes of ROM, and a high resolution 12" green phosphor CRT, capable of displaying 80 columns and 25 lines of data.

The C-10 Super Pak™ gives you all that and a keyboard, a 5¼" disk drive with 390K bytes of storage, a variety of software packages including Word Processing, a Financial Spread Sheet, Structured BASIC, Investment Planning, and the CDOS operating system.

Cost? Surprisingly low. Even Cromemco multi-use systems, which support CROMIX and UNIX, and main frame based, high-level languages, are priced well below competing alternatives.

Insystems. The systems experts.

At Insystems, we offer much more than a vast product line. We offer the technical expertise to help you configure a tailored system to match your individual needs. Our computer experts, intensively trained in all aspects of computers, peripherals, and board-level products, can aid you in selecting the components or systems that solve your problems in the most efficient manner possible.

That's the Insystems total system approach. And that extensive computer knowledge is yours whenever we do business together

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we make computers work for you

337 Moray Street, South Melbourne, 3205.
Telephone: (03) 690 2899.
Suite 11, 84 Pacific Highway, St. Leonards, 2065.
Telephone: (02) 439 3788.
and Dealers in all States.

CROSS NEEDLE METER
DAIWA

QUALITY PRODUCTS FROM . . .

VICOM

VIC Vicom International Pty Ltd
P O Box 366 South Melbourne 3205
Telephone 62 6931 Telex AA36935

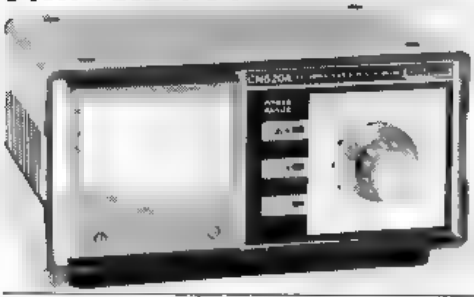
NSW Vicom International Pty Ltd
118 Alfred Street, Milsons Point 2061
Telephone 436 2766 Telex AA70619

NZ Malvicom International Ltd
P O Box 31 009, Lower Hutt
New Zealand
Telephone 69 7625 Telex 74 3334

ANTENNA TUNERS

	CNW-219	CNW-419	CNW-518	
FREQUENCY	3.5-30MHz (8 bands)	1.8-30MHz Continuous coverage 17 bands	3.5-30MHz 8 bands	1.8-30 Mhz (Continuous coverage 17 bands)
POWER RATING	100W CW	200W CW 3.5-30MHz 100W CW 1.8-3.4MHz	1kW CW 50% duty)	200W CW (3.5-28 MHZ) 100W CW (1.8-3.4 MHZ)
INPUT IMPEDANCE				
OUTPUT IMPEDANCE	10-250 ohm		10-250 25-100 ohm (on 3.5MHz)	10-250 OHM
SWR				
[redacted]	30-100W	20-200W	20-200 kW	No Meter
[redacted]	225 x 90 x 245		225 x 90 x 275	155x75x95

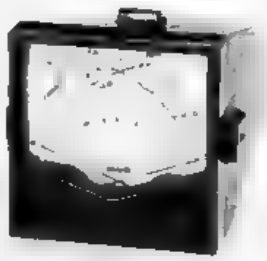
SWR AND POWER METERS



		CN-620A (B)	CN-660
FREQUENCY		50MHz	1.2-2.5GHz
INPUT/OUTPUT IMPEDANCE			
POWER	FWD	20-200-1kW-2kW	2-20W
	REF	4-40-200W-400W	0.4-4W
SWR DETECTION SENSITIVITY		4W min	0.4W min
TOLERANCE (full scale)		± 0%	± 15%
CONNECTORS		239	N type
DIMENSIONS (W x H x D mm)			

Compact Size Cross Needle Meters

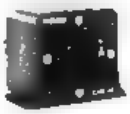
	CN-520	CN-540	CN-550
FREQUENCY	1.8-60MHz	50-150MHz	144-250MHz
POWER RANGE	200 mW	20-200W	
IMPEDANCE			
METER ACCURANCY			
CONNECTORS		50-239	
DIMENSIONS (W x H x D mm)			



NEW MOBILE METERS

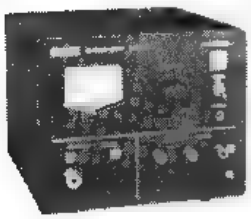
	CN-440	CN-460
Frequency	35-150MHz	140-525MHz
Input output impedance	50 OHM	
Ratio of forward to reflected power	3	
Power range Forward (Reflected)	1kW-50W 1W-5W	1kW-150W 1W-15W
Tolerance	± 10% At FULL SCALE	
SWR measurement	1:1-3	
SWR alarm sensitivity		
Input output connectors	SO-239/PL-259	SO-239/PL-259
Dimensions	77(W) x 78(H) x 100(D)	

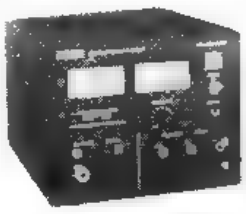
Coaxial Switches



	CS-301/CS-301N	CS-401	CS-6
FREQUENCY	500MHz	800MHz	1500MHz
VSWR	below 2		
POWER RATING	2.5kW PEP 1kW CW	500W PEP 250W CW	
IMPEDANCE	50 ohm		
INSERTION LOSS	less than 0.2dB		
ISOLATION	better than 40dB at 150MHz better than 45dB at 450MHz adjacent terminal		better than 60dB
CONNECTORS	SO-239 N type	SO-239	BNC
OUTPUT PORT	2	4	4
Unused terminals grounded			

POWER SUPPLIES



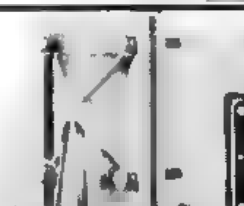


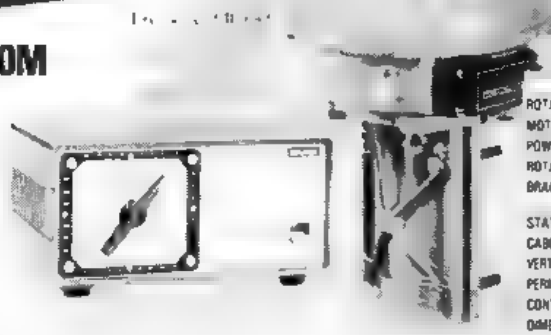
. . . PLUS THE NEW PS-80M

ANTENNA ROTATORS

GOING OUT AT SPECIAL PRICES.

PLEASE RING FOR PRICES BETWEEN 9 AM AND 5 PM MONDAY TO FRIDAY.





	OR-7500R/X	OR-7600R/X
ROTATION TORQUE	500kg-cm	600kg-cm
MOTOR	24v AC	
POWER SOURCE	30v AC	
ROTATION TIME (50/60Hz)	60-50 sec	64-53 sec
BRAKE	Mechanical	Mechanical & electrical
STATIONARY BRAKING TORQUE	2000kg-cm	4000kg-cm
CABLE TO BE USED	6 core control cable	
VERTICAL LOAD	200kg	
PERMISSIBLE MAST SIZE	38-65mm	
CONTROLLER		
DIMENSIONS (W x H x D mm)	80 x 85 x 20	

Silent Keys

It is with deep regret we record the passing of —

MR JOHN LARK	VK2OA
MR R J MOORE	VK3XEY
MR W R PARKER	VK4PT
MR K REICHSTADTER	VK2KBG

Obituaries

DENZIL (DEN) KELLY VK7DK

It is with very deep regret that we announce the passing of Denzil (Den) Kelly on the 19th of July in Launceston. Den was born in NSW and for a time lived in SA where he held the call of VK5DK. He came to Tasmania in the early sixties on behalf of the Phillips organization and was engaged with the installation of the TV Towers.

He liked Tasmania and stayed, joining the staff of the Hydo-Electricity Commission as a Technical Officer for the north of the island. He was an active DXer and was high in the Australian DXCC totals. He served a term as President of the Northern Branch of the Tasmanian Division in the early sixties.

He was deeply involved with the South East Asia Net (SEAnet) and was well-known throughout the DX Fraternity as Net Control Station in the mid-70's. He also was able to attend the SEAnet Conventions in Penang, Malaysia and Tokyo, Japan, where he met many of the voices on 14.320 for an eyeball QSO. Although of late, he stepped down as NCS, he still checked in when there was propagation.

Den was keen to help fellow members and associates with their Morse. Several full calls in the north were successfully coached to obtaining their 10 WPM.

He was interested in VHF and worked through the Oscar Satellites. Although he was in poor health, he was still interested in what was happening.

We offer our sympathy to his wife, Verna and he will be missed, not only by his friends in VK7, but his many overseas friends on SEAnet also.

Robin L Harwood VK7RH.

AD

A member of the WIA and the Old Timer's Club, he will be sadly missed here and by all his overseas friends. To his wife, Verna, we extend our sincere sympathy.

VK7PF

AD

IONOSPHERIC PREDICTIONS

Unfortunately Len VK3BYE has been indisposed this month and was unable to evaluate the charts for this issue. Best wishes for a speedy recovery Len, and we look forward to your predictions next month.

QSP

NEW MICROCHIP PLANT FOR BRITAIN

Microchips with circuits having capabilities equivalent to 250,000 transistors will be produced in a new facility being established by Plessey Semiconductors at Plymouth, south-west England, being ready for production by the end of 1985.

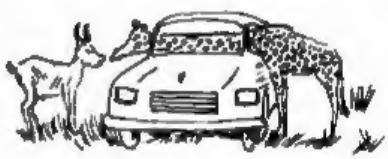
Production will concentrate on application-specific integrated circuits – those which are designed for a particular function. Although the facility will be designed to handle 152 mm wafers at one micron, the initial production will be based on 127 mm wafers at two-micron resolution. These could give the equivalent of a quarter of a million transistors on a single chip.

Initial capability of the plant will be one thousand 127 mm wafer starts per week, rising to five thousand 152 mm wafer starts per week by 1990.

from News from Britain – 6 August 1984

AD

NOTICE



All copy for inclusion in December 1984 Amateur Radio must arrive at Box 300, Caulfield South, 3162 no later than midday 25th October.

HAMADS

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write on separate sheets, including ALL details, eg Name, Address, on both. Please write copy for your Hamad as clearly as possible, preferably typed.*

- **Please insert STD code with phone numbers when you advertise.**
- Eight lines free to all WIA members. $9 per 10 words minimum for non-members.
- Copy in typescript please or in block letters double spaced to PO Box 300, Caulfield South 3162.
- Repeats may be charged at full rates.
- QTHR means address is correct as set out in the WIA current Call Book.

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows: The rate is $15 for four lines, plus $2 per line (or part thereof) minimum charge $15 pre-payable. Copy is required by the deadline as stated below indexes on page 1.

TRADE HAMADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and transmitter applications. For data and price list send 105 x 220 SASE TO: RJ & US IMPORTS, Box 157, Mortdale, NSW 2223. (No enquiries at office: 11 Macken Street, Oakley, 2223).

WANTED — ACT

CRYSTALS to suit Kenwood 2m tcvr as follows: repeater 6 tx, O/P freq 146.300MHz, xtal freq 12.191.66MHz. Repeater 7 tx, O/P freq 146.350MHz, xtal freq 12.195.83MHz. Dave VK1GD, QTHR. Ph: (062) 54 1798.

WANTED — NSW

CIRCUIT DIAGRAMS & CONVERSION DETAILS to 2m for a highband Pye Overland, model F10, type FM706 O/V/12. Any costs incurred will be refunded. Contact Peter VK2TE on (02) 887 2709 or PO Box 562, Artarmon, NSW, 2064.

SIGNAL GENERATOR with audio modulation and xtal facility. Must be accurate. Quality GDO, also xtal marker. All with manuals if poss. Also pre 1930 radio parts, valves, old valve books, old horns, dials, parts of early xtal sets. Exchange some ex army and air parts. Bert. (048) 61 2092.

YAESU FT-7 tcvr with power supply, VK2OQ, QTHR. Ph: (02) 644 7512.

WANTED — VIC

FEDERAL TAPES are produced using a Grundig TK-20 recorder. We need a spare. Going OK or not. Can you help? VK3OM, QTHR or contact Federal Office.

FT-7B tcvr & mobile mount bracket required. Good cdx. Options considered. Details to Tony VK3ATR, QTHR or Ph: (03) 336 1054.

WANTED — QLD

SCHEMATIC DIAGRAM with voltages etc for Tono 7000. Jack VK4VAS, QTHR. Ph: (07) 396 7139.

VALVE SOCKETS & COOLING CHIMNEYS, types SK600 & SK605 respectively to suit XMTG valve type 8904/4CX350FJ. Also require full tech data on above valve & sockets to suit valve types 807 & YL1240. Pat Brennan VK4BES, PO Box 96, Darling Heights, Qld, 4350.

YAESU HF MOBILE ANTENNA SYSTEM to include 10, 15 & 80m band operation. Replies welcome from interstate. Please contact Mike VK4VIX, PO Box 101, Toowoomba, Qld, 4350 or Ph: (076) 32 7455.

WANTED — SA

CONVERTERS for 432 & 1296MHz. Details to Chris VK5MC, QTHR. Ph: (087) 35 9014.

EARLY POST WWII PARTS for reconstruction of period amateur equipment. Valves-807, 5V4G, 5Y3G, 6V6G, 6J7G (with shield). WWII 5mA meters, 1.25 inch RCS plug in coil formers, Aegis 180 & 325 degree indicator plates, Aegis 455kHz IF coils, Jabel push-down terminals. RCS midget capacitors, period resistors, pots etc. Ivan VK5QV, QTHR.

WANTED — WA

CRYSTALS — 1700kHz & 500kHz. Rod VK6AOK, QTHR. Ph: (09) 386 1998.

KENWOOD TS-520S or similar tx with mic & tuner. Paul Clements VK6NPC, 28 Palmer Street, Warnbro, WA, 6169. Ph: (095) 27 5564.

VALVES — 6AE8, 6BV7, 6AV6, 6BA6. Write, phone or despatch to Ken Gillon, 5 Hillegine Court, Gosnells, WA, 6110. Ph: (09) 398 7829.

FOR SALE — ACT

YAESU FRG-7 rx. $230. VK1GD, QTHR. Ph: (062) 54 1798.

FOR SALE — NSW

HYGAIN TH6DXX TRI-BAND BEAM, Diawa DR-7600R rotator (both brand new in cartons) plus very good 46 ft (14 metres) galvanised crank-up tower. $700 the lot. Will consider individual sale. Neil VK2MG, QTHR. Ph: (02) 449 2782 AH.

ICOM IC-202 2m SSB tcvr $100. FDK multi 7, 2m FM tcvr, 2W/10W. Fitted with xtals for 7 rep, 2 simplex chan. New cond. $100. VK2AVQ, QTHR. Ph: (02) 88 2359.

ICOM 720A tcvr. Excel cond, with manual & carton. $899. Yaesu FT-290R w/nicads/carry case/adap chgr/lead & manual. As new, very little use. $329. Paul VK2DOU, QTHR. Ph: (02) 569 5639.

ICOM 751 — MANUAL & MIC $1275. Imported by Icom-Katsumi EK150 keyer. $160. 12-5/8" dia steel gal turnbuckles $72. Ph: (02) 918 3835.

KENWOOD TS-120S with 20A H/B power supply $550. Super Panther CB with many mods inc 28MHz etc plus 80m t/verter $150. Siemens 100 teleprinter with SE Qld mod/demod, power supplys etc $150. Much misc gear also avail inc D/T CRO, ATUs, power supplys etc. Eric VK2DQH, QTHR. Ph: (066) 53 8350 AH.

TRANSFORMER — 240 to 110V. About 30A. Sale exchange or best offer exchange vintage pre 1930 radio parts. Bert. Ph: (048) 61 2092.

WARTIME RADIOS & acces. Hundreds of items. Enquiries Tim (060) 20 3225.

YAESU FT-707 tcvr $550. FV-707DM ex VFO. 12 mems $195. FC-707 ATU $95. YM-35 scan mic $20. Chimside CE-5SS, 5 band trapped vertical $75. All as new with manuals & cartons. Ph: (02) 624 3017.

FOR SALE — VIC

COMPLETE MOBILE AMATEUR STATION in USA. 24' caravan with Ford Mercury auto sedan. Tilt-up Hy Gain 18 AVT, 5 band ant. 500W generator, tools, (2m & Yaesu 757GX tcvrs if required). Caravan fully equipped for 4 persons. Needs only you & your clothes. Available for personal handover at Los Angeles mid November 1984. For details & photos contact, Rob Plowman VK3XKO, 7 Masaryk Court, Vermont, Vic, 3133. Ph: (03) 874 7173.

ICOM IC-202 2m SSB VGC $135. 2m 10W linear to suit 202 or handheld FM $25. Icom ICRM-3. Remote control for 701/211. Complete but needs repair $25. Hy Gain 203BA, 3el 20m monobander. Superb performer $150. ATN 3el 10m beam $60. VK3OM, QTHR. Ph: (03) 560 9215.

KENWOOD TS-520S with noise cancelling mic MC-35S, ext spkr SP-520, h'book, little use, excell condx $420. David VK3DWS. Ph: (03) 561 4416.

KENWOOD TS-120S tcvr. Remote VFO. Power supply PS-30. ATU Yaesu AT-107. Etx spkr SP-20. 21m length hi-power, low loss coax. 21MHz-14MHz 1/2 wave dipole antenna, balun & rigging. All in A1 condx, with service manuals. The lot $800. Separated, price by negotiation. Alex ex H44AK. Essendon. Ph: (03) 337 7680 AH or (03) 357 1179 BH.

TET HB-35C, superior performance, broadband, tri-band beam. Better than 3el full size beam on 20m. Only 4m boom. Excellent, as new condx. $349 ONO. VK3ARZ, QTHR. Ph: (03) 584 9512.

YAESU FT-901 DM with hand mic $800. Yaesu FTV-901 R 6m, 2m & 70cm $500. Yaesu FLDX-400 TX. Spare finals with QM-70 28/144MHz. T/verter $160. Astor minicamera & monitor AMC2AX incl mod, composite video out $160. Palomar RF t/former, 500W. 8,12.5, 16,22,32 to 50 ohm $75. Kenwood hamclock, 24 hour analog. $20 ONO. Max VK3BAX, QTHR or Geelong (052) 9 7401 after 1830 hours.

FOR SALE — QLD

HILLS TOWER 101', (Teletower 101) winch-up. Top condx, owners leaving state. ONLY $800. Also Chimside CE-35DX, 5el triband beam with KR-600RC rotator. Half price. Will separate. Peter Holland VK4XX. Ph: (075) 33 9362 AH.

LARGE ASSORTMENT OF RADIO VALVES Mostly new. 6AL3, 6AW8, 6BH5, 6BR7, 6BV7, 6BU8, 6BL8, 6BX6, 6BD7, 6BY7, 6CS6, 6CH6, 6CW5, 6EA8, 6EJ7, 6ES8, 6M5, EN3, 6N6, 6V9, 6Y9, 6HG8, 12AU7, 12AD7, 12BA6 & lots more. 50 cents each. Fred VK4RF, QTHR. Ph: (07) 200 7916.

FOR SALE — SA

FT-726R all mode tri-bander. 70cm, 2m, satellite modules. As new, carton. $1300 ONO. John VK5JM, QTHR. Ph: (08) 382 4949.

KENWOOD TS-830S all band tcvr & ext VFO 240 & spkr SP-70. Exc condx, orig packing & manual. $800 the lot. Ron VK5UW. Ph: (08) 337 0502.

YAGI — VK3BWW DUOBAND, 15-10m, 1 year old. Dismantled $100. 12m heavy duty 52ohm coax & plugs $20. M A Jones VK5BVJ, C/o Carpenter Rocks, SA, 5291. Ph: (087) 38 9000.

FOR SALE — WA

FT-290R 2m SSB/CW/FM, mobile bracket, case, nicads & charger $290. TR-7010 2m SSB/CW 10W, mobile bracket $100. FT-620 50-54MHz SSB/CW/AM, CW & AM filters. Good condx $250. All offers considered, delivery arranged. Wayne VK6AMS. Ph: (097) 55 4106.

GRANGER 174/3 100W tx with power supply $50. Granger 174/2 50W tx, 12V $30. Inverter 12V to 250V 300W $25. Grundig 12B satellite rx $40. Rotel SS stereo amp 12W $25. VK6LL, QTHR. Ph: (09) 446 1588.

ANSWERS

NOVICE TRIAL EXAM.

1. c	11. a	21. c	31. d	41. a
2. d	12. d	22. b	32. d	42. c
3. a	13. b	23. a	33. c	43. d
4. b	14. d	24. d	34. a	44. a
5. b	15. c	25. b	35. d	45. b
6. c	16. c	26. d	36. a	46. b
7. a	17. b	27. b	37. d	47. c
8. c	18. c	28. c	38. c	48. d
9. c	19. d	29. a	39. b	49. d
10. c	20. d	30. b	40. a	50. a

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Cat. XC-2010

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Cat. XC-2036 ONLY **$29.50**

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This microbot is powered by 2 DC motors that drive wheels. When special ultrasonic whistle is blown, the unit goes left, right, straight ahead according to your command. Complete, including perspex dome cover! Be a Pied Piper!

Cat. KJ-6680

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This robot is controlled by a keyboard (which is supplied). The keyboard plugs into the robot. Up to 256 discrete commands can be entered into the robots memory (RAM). The robot will then move according to programmed instructions. Lights and a buzzer can also be programmed to operate as well.

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Jaycar has made a sensational SCOOP PURCHASE of B.S.R. belt drive turntables from England at below manufacturers cost!

Two models available AA-0290 works from 9-12V DC and the AA-0292 from 240V AC (includes 12V 400mA adaptor). The DC motor drive is electronically controlled.

SPECIFICATIONS: ★ Dimensions 330(W) x 285(D) x 60(H)mm overall ★ Platter diameter 280mm ★ 2 speed - 33 & 45 rpm (internally adjustable) ★ Pick-up arm counterbalanced type with cueing facility ★ Pick-up ceramic (stereo) with diamond stylus ★ Turntable operation - auto stop, will return to rest automatically. turntable chassis is sprung on all corners with transit screws and clips ★ Weight 1.5kg ★ Output stereo RCA sockets underneath unit.

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(requires 9-12V DC @ 400mA)

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(includes 12V 400mA adaptor)

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It will supply up to 4 outlets with a total load of 6 amps (unswitched).

Cat. MS-4010

ONLY $99

Single 10 amp line-socket type filter (unswitched).

Cat. MS-4012

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Compact, very stable ultra low power transmitter. So stable that 10 of them will sit side-by-side on 1MHz of bandwidth and not interfere with each other. Low current drain from a 9V battery, works in the little used low-end of the FM band. Tuneable. Line level input with trimpot attenuator. Low noise Hi Fi.

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Cat. DT-5450

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NEW - PROGRAMMABLE MOBILE ROBOT

Low-cost fun learning with this sophisticated robot! Have hours of educational fun programming this fun device to do what you command through the 25 key keyboard on its head!!

FEATURES: ★ 4 bit microprocessor controlled ★ 3 speed gears selected by programming thru' micro ★ Can travel in 4 directions plus angles and curves ★ Has lights and audio ★ Complex routines can be easily programmed (up to 48 commands long).

Cat. XR-1024

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